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CONTENTS.

Original Communications.

The Action of Antitoxin. By Joseph McFarland, M.D..... 433
The Treatment of Diphtheria Other than with Antitoxin. By J. P. Crozer Griffith, M.D..... 436
The Present Aspect of the Antitoxin Treatment of Diphtheria. By J. Dutton Steele, M.D..... 439
A Case of Tea-intoxication with Spinal Symptoms. By Alfred Gordon, M.D..... 444
Hepatic Inadequacy and its Relation to Irregular Gout, with Special Reference to Treatment. By I. Burney Yeo, M.D., F.R.C.P. 446

Leading Articles.

The Prevention of Malaria..... 454
Therapeutic Optimism vs. Therapeutic Nihilism..... 455
Substances which Increase the Flow of Bile..... 457
The Use of Suprarenal Gland for the Relief of Pain..... 458
Shock Following Abdominal Contusion 458
Some Recent Extraordinary Therapeutic Suggestions..... 459

Reports on Therapeutic Progress.

The Treatment of the Heart in Typhoid Fever and Other Infectious Diseases..... 453
Quiet Effusion into the Knee-joints Occurring in Women and Young Girls..... 460
The Recent Epidemic of Typhoid Fever in South Africa..... 461
The Treatment of Tuberculous Peritonitis 462
Tropical Dysentery..... 463
Treatment by Drugs of Paralysis Agitans 464
Quinine as an Oxytocic..... 467
The Local Use of the Normal Saline Solution..... 467
The Treamtent of Epilepsy with Opium and Bromide..... 469
The Control of Cough in Tuberculosis 470
The Treatment of Acute Articular Rheumatism by Puncture of the Joint and Injection of Carbolic Acid 470
The Employment of Heroin in the Treatment of Pain..... 470
The Treatment of Hemoglobinuric Fever..... 471
The Action of Opium on the Stomach 471
Hematoporphyrinuria Following Chloroformization 471
The Treatment of Delirium Tremens by the Intravenous Infusion of Saline Solution..... 472
Inoculation Against Enteric Fever 473
On the Uses of Formalin in Glycerin 474
A Report of Three Cases of Thoracic Aneurism Treated by Subcutaneous Injections of Gelatin. 475
Treatment After Abdominal Operations 476
The Treatment of Endocarditis... 479
The Value of Alcohol in the Acute Infectious Diseases of Children.. 480
Rhus Glabra in Enuresis..... 481
Operations on Diabetics..... 481
Simple Operation for Hemorrhoids—Enucleation 482
Perforation of the Intestine in Typhoid Fever..... 483
The Surgery of the Turbinal Bodies with a New Method of Operating 483
Ichthyol in Treatment of Deep-seated Inflammations..... 484
Diagnosis and Treatment of Laryngeal Cancer..... 485
Secondary Hemorrhage After Use of Suprarenal Extract..... 485
Carbolic Gangrene..... 485
Treatment of Acute Gonorrhea... 486
The Radical Treatment of Malignant Disease of the Larynx..... 487
Points in the Classification and Diagnosis of Some Joint Affections 487
Treatment of Chronic Gonorrhea. 487
When is a Gonorrhea Cured?..... 488
Primary Amenorrhea..... 489
Peritonsillar Abscess..... 490
Perigastric Adhesions..... 491
Interscapulothoracic Amputation for Sarcoma of the Shoulder..... 493
Treatment of Cancer..... 493
Treatment of Chronic Hydrarthrosis of the Knee..... 494
Parallelism of the Local and General Leucocytoses in Morbid Processes 494
Syphilitic Reinfection..... 494
Foreign Body in Right Bronchus. 494
Gastric Hemorrhage and its Surgical Treatment..... 495
Acute Cellulitis Treated by Antistreptococci Serum..... 495
Median Osteotomy of the Hyoid Bone 496
Iodide of Potassium Treatment of Human Actinomycosis..... 497
Treatment of Sciatica by Cocainization of the Spinal Cord..... 497

Reviews..... 497

Correspondence.

London Letter..... 500
Paris Letter..... 502

Original Communications.

THE ACTION OF ANTITOXIN.

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During the early period of serum therapy, the novelty of the subject and the peculiarity of serum manufacture made a certain cautious hesitation in the use of the antitoxin quite justifiable. During the seven years which have elapsed, however, the knowledge of the subject has grown so enormously, its limitations have become so clearly defined, and the nature of the toxin-antitoxin reaction so elucidated, that skepticism can have no further basis than ignorance upon which to fall back.

The speakers who preceded me this evening have so thoroughly covered the etiology, symptomatology, pathology, and treatment of diphtheria that I feel it would only be a trespass upon your time should I append anything to their already extended remarks, and during the time allotted to me I beg to call your attention to some facts, by themselves of little interest to the practical man, which have been published, for the most part, in journals not commonly read by practitioners.

The protective substance or power that is known to us as antitoxin is of phenomenal occurrence. Small quantities may possibly occur in the blood and tissue juices of a few

normal animals both in natural and acquired immunity, but it is difficult to demonstrate its presence except in the entirely abnormal condition known as "forced immunization." By this term I refer to an exaltation of immunity which results from the gradual progressive administration of a poison until the resisting power of the animal has risen to one hundred or more times that which could possibly have occurred in nature.

Thus, a susceptible animal suffers from tetanus and recovers by acquiring resistance to as much toxin as the tetanus bacilli have formed in its body—presumably somewhat less than would have caused death. If this resistance depends upon the presence of antitoxin, the total quantity produced is not much more than will neutralize the effect of the fatal dose, and small quantities of the animal's blood if examined reveal the presence either of no antitoxin or of almost inappreciable quantities. If after this recovery the experimenter take the animal in hand and inject beneath its skin what is estimated to be a fatal dose, then somewhat more than a fatal dose, then two, three, five, ten fatal doses, and so on until say one hundred fatal doses have been administered, the resisting power of the animal is each time increased, and with this increase of resistance there is a more or less marked increase of antitoxin, until after the enormous doses that characterize the end stage of the treatment, it appears in large quantity.

The best explanation of the phenomenon has been offered by Ehrlich[1] in what is known as the "lateral chain theory." Briefly stated, this theory teaches that in certain cells of the body for which the toxin has a definite affinity—tetanus toxin for the motor nerve cells, etc.—there are molecular elements, described as "haptophorus," which readily combine with it. It is the ability of these molecules to effect a combination with the haptophorous or combining elements in the toxin that secures the primary resisting power of the animal. The combination is succeeded by a regeneration of the haptophorous substance of the cell in a quantity slightly in excess of the normal, possibly, the result of the original stimulation. If the stimulation is often repeated, and in consequence much of the haptophorous substance (Ehrlich views the haptophorous substance as a lateral chain of molecules) is needed, it is formed in superabundance and discharged into the blood, which as a result appears charged with combining (antitoxic) substance.

Ehrlich and his followers base their entire theory of immunity and antitoxins upon the existence of such lateral chains, and Wassermann[11] has shown that in certain cases artificially prepared haptophorous substance may protect the animal as perfectly as that naturally formed. Thus, he found that if some of the central nervous tissue of a guinea-pig be crushed with tetanus toxin, its haptophorous substance at once formed a union with it by which the toxin became harmless when introduced into a guinea-pig, and that if the comminuted nervous tissue which contained the haptophorous substance was injected into an animal which was subsequently injected with tetanus toxin, enough of the haptophorous substance remained in the blood to annul its effects. There is an apparent paradox in a small quantity of nervous substance affording protection to an animal with its whole nervous system intact, but the explanation seems to be that the normal nervous structures furnish only some of their substance as lateral chains for combination, while the comminuted nervous substance, having no longer any physiological function to perform, yields all of its substance for combination. That the antitoxin which appears in the blood is a new substance and one depending entirely upon the process of immunization is amply shown by the facts that it is not present in the normal animal, that it increases up to a certain point during immunization, and is speedily eliminated and disappears when the stimulation depending upon the toxin injections is discontinued.

The formation of antitoxin, while it leads to a physiologically unusual condition, can scarcely be described as a pathological process or condition. The animal is in every way in perfect health, and it is rather an exaltation of an already existing normal condition than the production of a new morbid one.

From the foregoing it may therefore be inferred that *the production of antitoxin is a reaction of immunity.* It will be shown and emphasized that *it is only one of many reactive phenomena manifested by animals in response to vital stimulation.*

The data upon which this conclusion is based have been obtained through experiments directed toward the determination of the toxin-antitoxin reaction or interaction.

How does antitoxin act? There are two theories regarding this. The first, which has met most support at the hands of French investigators, is that the antitoxin stimulates a vital change in the body cells, particularly the leucocytes, by which they become unusually resistant to the influences of toxins, endure their presence without injury, and, as far as the leucocytes are concerned, destroy them by the generation in their cytoplasm of neutralizing substances. Roux and his followers have always stoutly supported this view, and Calmette[2] has offered what seems like excellent evidence in its favor.

The second theory, which is championed by the Germans and English, is that the interaction of the toxin and antitoxin is a purely chemical one in which the animal is entirely passive, that which takes place in its body being identical with what occurs when the two substances are mixed in a test-tube. This view naturally suggests itself when we consider that when toxin and antitoxin are mixed *in vitro*, the effects of the former are neutralized or annulled; and the law of multiples discovered by Behring, that any given number of fatal doses of the toxin would be annulled in action by the proper relative proportion of antitoxin, seems to confirm it. There is, however, no logical reason why, if the action is vital, enough vital stimulation effected by enough antitoxin should not be capable of overcoming the action of any given quantity of toxin.

Calmette[2] offered this proof that the action was not chemical. He mixed cobra venom and its antitoxin, *antivenene*, in a test-tube; then heated the mixture to a temperature at which the antitoxin was destroyed by coagulation, though the venom remained unchanged. If the reaction between the toxin and antitoxin were a chemical one, this heated mixture should be innocuous, but as a matter of fact, when the antitoxin is precipitated by heat, the activity of the venom returns. This Calmette believed proved the reaction to be vital, not chemical. Martin and Cherry,[8] however, upset his calculations by showing that if the mixture of venom and antivenene were permitted to stand at 37° C. for twenty minutes before being heated, the activity of the venom did not return after heating the mixture, and so proved that the reaction is chemical and required a certain length of time and a certain temperature for its completion. They also constructed a physical apparatus in the form of a gelatin-covered porcelain filter which was pervious to the molecules of toxin, but not pervious to those of the antitoxic serum. Unless a chemical reaction occurred between the toxin and antitoxin, when a mixture of the two is filtered, the unchanged toxin should pass through and destroy animals as the unmixed venom would. They found, however, that the filtrate was harmless.

Most interesting test-tube experiments were later developed to show that the "antiserums," while they may possibly exert some vital action, certainly act chemically. Thus, Ehrlich[4] found that ricin had the power to agglutinate red blood-corpuscles, but that this test-tube reaction is entirely suspended by the presence of a few drops of anti-ricin.

The poisonous blood of eels, serpents, and toads, an active substance produced by the tetanus bacillus and known as tetanolysin,[12] one of the active elements of cobra venom, and substances found in the venoms of other serpents, all have the power of laking blood—*i. e.*, of dissolving the hemoglobin out of the red corpuscles when applied to diluted defibrinated blood, in dilute solution, but the addition to any of the mixtures of a proper proportion of the serum of an animal immunized to the respective hemolytic substance immediately checks the process, and not only can it be inhibited, but the progress of the hemolysis can be checked at any moment at which the proper proportion of serum is added.

The experiments of Ehrlich and Morgenroth,[4] Metschnikoff,[5] von Düngern,[6] Bordet,[7] Myers,[8] Stevens and Myers,[9] and others who have investigated these phenomena, are of the greatest interest.

The reactions, however, do not cease here, but extend to the field of enzymes. Morgenroth[10] has found that the curdling ferment or rennet, when injected into animals, leads to the formation of an antirennin, by which the activity of rennet upon milk can be checked, the reaction taking place in readily calculable proportions.

Bordet and Gengou[7] have experimented with fibrin ferment and have succeeded in producing an "anticoaguline"—*i. e.*, a serum which prevents coagulation of blood to which it is added—by injecting animals with blood and fluids rich in the fibrin ferment. This reaction also is subject to control in fixed proportions.

It is even possible, if the observations of Metschnikoff are correct, to alter the physiological equilibrium of the body by the introduction of its tissue elements in abnormal condition, so that lysins, or solvents, for the respective injected tissue elements are generated.

This is perhaps best shown in the experiments of Ehrlich and Morgenroth and von Düngern, who found that a few injections of the blood of one animal into another animal conferred upon its serum the property of rapidly destroying the corpuscles of the animal injected, not only *in corpore*, but also *in vitro*, and that this action was specific, depending upon the presence of (1) an immune body, and (2) complementary bodies in the serum.

The lesson to be learned from these facts is very obvious in the practical application of immune serums to the treatment of disease. Remembering that the reaction upon which recovery depends partakes so largely of a chemical nature, and that it occurs only in definite proportions, no latitude is given for personal opinion regarding dosage. The doses given should always be large, and in excess of the quantity probably required.

In practice we are not working with test-tubes, nor can we in any way calculate, even approximately, how much toxin formed and to be formed in the patient's throat we are to neutralize by the injection of antitoxin. *Always give the maximum dose.* If it be too much, very little harm can possibly result, but if it be too little, it may afterward be too late for successful interference.

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*THE TREATMENT OF DIPHTHERIA OTHER THAN WITH ANTITOXIN.**

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With the advance in the use of antitoxin for diphtheria the discussion of other methods of treatment receives constantly less attention in our text-books and journals. In fact, much of the advocacy of the use of drugs has become really only ancient history, and any attempt in this connection at a review of it all would be not only wearisome but useless. In the present state of our knowledge, however, we would err greatly in putting sole dependence on any one line of treatment, valuable though this might be; and we may well consider some of the methods, hygienic and medicinal, upon which we can most depend as an aid to the action of diphtheria antitoxin.

A. Prophylaxis.—Since the disease is an exceedingly contagious one, and one whose germs have a remarkable vitality, every effort must be made to prevent the spread from the sick to the well. Thorough isolation of those affected is, of course, important, as is the careful disinfection of everything which has been in proximity with the patient. Not only so, but individuals in any way concerned in the nursing of patients with diphtheria must come as little as possible into contact with others, since, without having the disease themselves, they may readily convey it. Children of the family should be taken from the house whenever possible, and, further, themselves quarantined for a time—ten to fourteen days—lest they carry it to others. It is a matter of repeated observation that the germ of the disease can often be found in the throat of a healthy nurse caring for a case of diphtheria.

The nurse in attendance should wear, of course, wash dresses, and a cap which thoroughly covers the hair. On leaving the room for her necessary outings, she must change her dress and disinfect her hands and face. The physician must never forget that he can himself readily become a source of danger to his other patients. Before he enters the sick-room he should cover his clothing with a garment of rubber or linen,

*Part of a Symposium on Diphtheria read before the Philadelphia County Medical Society.

and it is much better, too, if he can put on his head some such article as the oiled silk cap worn by women bathers at the seashore. On leaving, he should wash his hands and face with a disinfectant, such as a solution of carbolic acid or lysol.

As in all infectious diseases, the room should be carefully selected in the upper part of the house, if possible opening into another room, best a bath-room. The windows of this anteroom should be kept open as much of the time as possible. All ingress to the sick-room should be through the anteroom, and the other door of the sick-room leading into the entry should be locked, and the cracks stuffed with cotton or closed in some similar manner. It is commonly advised to hang a sheet moistened with a disinfecting fluid, such as carbolic acid or corrosive sublimate, at the door leading from the entry into the anteroom. It is questionable whether this is of real service, yet, as it may be so, it is well to have the practice enforced. All upholstered furniture, curtains, books, toys, etc., should be removed, and the carpet taken up and replaced by old rugs or strips of carpeting which may be destroyed later. Pieces of old linen should be used in place of handkerchiefs, and must be burned immediately. All the bed linen and personal linen of the patient should be soaked in a disinfectant solution in the anteroom before it is removed for washing. All excreta should be disinfected with a sublimate solution. The meals of the nurse should be carried to the door of the anteroom and there taken in by her. After using, the plates, forks, and so on, should be washed in a disinfectant, preferably carbolic acid, as bichloride will, of course, injure metal.

When the disease is over, the room should be washed with a disinfectant and then fumigated with formalin. Although this substance has but limited penetrating power, it is at least serviceable to a certain extent. Finally, the mattresses and pillows should be steamed, if this is possible, and the room repapered and painted.

For their own safety, the most careful supervision must be kept over both the throats and the noses of all members of the family, since the development often occurs of attacks so light that they would otherwise be overlooked. It is such cases which are especially liable to spread the disease abroad. Then, to prevent members of the household unavoidably exposed from contracting the affection, the systematic, frequent use of antiseptic gargles is to be recommended. For such purposes, diluted solutions of corrosive sublimate 1-to-10,000, weak carbolic acid solutions, diluted chlorine water, etc., are to be recommended; and for the nose, alkaline antiseptic sprays.

After the disease is over, the patient must still be isolated for at least three weeks from the beginning of the attack. A still better method, where cultures can be taken, is to continue isolation until the Klebs-Loeffler bacilli can no longer be found in the throat.

B. Treatment of the Attack.—The treatment of the attack itself may be divided into: (1) Hygienic and dietetic; (2) local; (3) general and constitutional.

1. Hygienic measures do not differ materially from those to be employed in other infectious diseases. The room must be kept at an even temperature of about 70°, draughts avoided, yet ventilation carefully attended to. The last is best obtained by means of a fireplace or by ventilating through the windows of the anteroom. The bedclothing and the linen of the patient should be changed frequently, as this often adds greatly to the sense of comfort. Daily ablution can be carried out in nearly all cases, with proper precautions against chilling and fatigue. Care must always be taken to avoid sudden movement of the body, either voluntary or made by the nurse, on account of the well known weakness of the heart which attends the disease. This holds good even after convalescence. In fact, even the mildest cases should be confined to bed in a recumbent position throughout the attack.

In cases giving rise to offensive exhalations, the use of deodorants in the room is of advantage, such as the burning of aromatic pastils, the employment of benzoin sprays, and the like. But it is to be remembered that the use of such measures, or of many so-called "disinfectants," in the room is valueless so far as the destruction of germs is concerned. The standing about of dishes containing chloride of lime or of soda, for instance, does no good whatever.

The diet of a patient with diphtheria should be liquid, and later semi-liquid, and always of a most nutritious nature. This is to spare both the stomach and in many cases the kidneys, involved, as they often are, by inflammatory conditions. The patient should be fed as far as possible at regular intervals, and with definite amounts. Where the con-

dition of the pharynx makes swallowing almost impossible, rectal alimentation must be resorted to. In this event some concentrated peptonized beef preparation is very serviceable.

2. Local. Much good is to be expected from this form of treatment, but a careful selection of measures must be made. The number of procedures advised is very large. We can consider only a few.

(*a*) Nasal diphtheria. Remembering that in many cases of diphtheria the disease begins in, or is even confined to, the nose, care should be taken in every case that this region receives treatment. The solution may be applied by means of an atomizer, but for thoroughness the use of a syringe is to be preferred. To use a syringe, the patient should be recumbent, with the head well turned to one side. The fluid should be injected into the upper nostril, returning through the other nostril, or through the mouth. The head is then turned to the other side, and the second nostril treated in a similar manner. All solutions should be tepid. Spraying the nose is apparently a less disagreeable form of treatment, and yet often the resistance of a child makes it just as productive of exhaustion. In fact, the advisability of using either form of treatment must be determined for each individual case. When the procedure is well borne, the frequency of its repetition depends entirely upon the degree of involvement of the nose and nasopharynx. Even when there is apparently no nasal involvement whatever, treatment of the nose is still advisable.

The solutions to be employed should be those which check bacterial growth or act as cleansers only, rather than those distinctly bactericidal. These latter are too powerful to be well borne. In many cases mild alkaline antiseptic sprays or douches are sufficient. Solutions of boric acid are also serviceable, as are those of borax. Trypsin has been highly recommended. It may be employed in a solution of one drachm to one ounce, in alkaline water. Papoid has also won considerable reputation, best in combination with bicarbonate of soda in solution. Bichloride of mercury in the strength of 1-to-5000 is sometimes employed. Peroxide of hydrogen is very efficacious. Care should be taken, however, first, that it is active; secondly, that it is not acid; and thirdly, that it is sufficiently diluted. A brand which is but little acid should be chosen, and any excess neutralized just before use by the addition of a little bicarbonate of soda or lime water. The dilution for use in the nose should be at least 1 in 4.

(*b*) Pharyngeal diphtheria. Various solutions may be applied to the pharynx by the syringe or on a swab or brush. As with local treatment of the nose, the question of using any application must be determined by the degree of resistance offered by the patient, and the resulting exhaustion. In the septic cases applications are greatly to be desired, yet in some prostration is too great to allow of it. In others the degree of prostration prevents any forcible resistance, and applications may well be made. Every case is a rule to itself, but the main rule is *"non nocere."*

For diphtheria of the pharynx, we may well use cleansing applications followed by those having bactericidal power. A method to which I am partial is the application of a solution of peroxide of hydrogen in full strength or slightly diluted, taking the precautions already mentioned. Immediately following this, Loeffler's solution is applied on a swab and held against the affected parts for a few seconds. This solution, as often prepared by druggists, consists of a combination of menthol, toluene, creolin, solution of ferric chloride, and alcohol. The application is painful and must not be repeated too often. Another very serviceable antiseptic application is a mixture of tincture of the chloride of iron, glycerin, and water, in varying proportions. Still other favorites, and deservedly so, are a solution of bichloride of mercury 1-to-1000, a solution of carbolic acid three to five-per-cent, chlorinated soda, and chlorine water.

The application of powdered substances by insufflation is used by many physicians. For this purpose are recommended papoid, trypsin, sulphur, pepsin, and so on.

(*c*) Laryngeal diphtheria. In involvement of the larynx local treatment must be largely by inhalation. Most useful in this connection is the employment of steam, or more properly, water-vapor, since precaution must be taken that actual steam does not approach too closely to the patient lest burns result. It is also important in using this plan of treatment that enough vapor be generated. A gentle simmering of a small pan of water in a large room is of no value whatever. Either the room must be kept full of vapor by plunging red-hot iron, hot bricks, and the like, into tubs of shallow water, or the child must be surrounded by a

croup tent, and the air within it kept moist by a steam atomizer or a croup kettle. A home-made croup tent can readily be constructed by tying a broomstick upright at each corner of the crib, connecting the tops by cord, and throwing blankets over the framework thus made. A small A-shaped opening is left near the head, and the vapor conducted in through this. It is often advised to medicate the vapor with benzoin, eucalyptus, turpentine, carbolic acid, and the like. It has always seemed to me questionable whether there was any real advantage in this addition.

3. General and constitutional treatment. It is certain that there is no drug which can be called a specific for diphtheria. At the same time, the thought sometimes arises that in our interest in the specific treatment of the disease with antitoxin we may perhaps be neglecting testimony on which we formerly relied, and which was based on very extensive clinical experience, viz., that help was to be had in many cases from the administration of medicine internally. At any rate, we cannot omit in this connection referring to two remedies once popular—mercury and iron. Mercury, absorbed into the blood, was supposed to act as a solvent upon diphtheritic membrane, and at the same time to diminish the virulence of the disease. In the form of the bichloride it has been very extensively employed. It was given in large doses, one-sixtieth to one-thirtieth of a grain, every two hours, for a child of two to four years. I formerly used it extensively, and do not remember ever to have seen any bad symptoms produced by it. This was the general experience with rare exceptions. Many physicians were thoroughly convinced that it was of great benefit. Whether this was or was not an error, it is impossible to say.

The same is true of the administration of calomel, the use of which was older and even more extended. It was given in fractional doses of a grain, or even in larger amounts, every two hours, the laxative action being guarded against. Another very popular method, especially in laryngeal cases, was the administration of calomel by fumigation, fifteen or more grains being volatilized on a hot iron and conducted into the croup tent, where the child could inhale it.

Iron, especially in the form of the tincture of the chloride, was long a most popular remedy, and great reliance was placed on it by many physicians of experience and ability. It was supposed to check the rapid destruction of the red blood-corpuscles. It was given in large doses, frequently repeated.

It is possible that both mercury and iron in large doses are not without some power in the treatment of diphtheria. Although, as stated, so many physicians believe in their power, we cannot tell their real value in the absence of large statistics.

Undoubtedly of service and of great importance in diphtheria is the employment of powerful supporting treatment. First in rank comes the use of alcohol. The depression accompanying the disease is enormous, and large doses of alcohol are frequently needed, and are well borne. I do not know of any other disease of which this is more true. In severe cases it must be given boldly, and further, its use must be commenced early and the amount increased rapidly if depression is seen to be growing. Of course, as with all drugs, its effect must be watched.

Strychnine is also borne in this disease with remarkable tolerance, especially by children, and in full doses has often, I am convinced, been the means of saving life. It is particularly useful where there is an increasing lack of tone in the pulse, or other reason to dread cardiac failure. Digitalis and other heart drugs are needed frequently and are of service.

High temperature must often be reduced, but there is nothing here characteristic of diphtheria which demands special remark, except a caution against any possibly depressing measures.

Other symptoms, as well as the various complications and sequelæ, require treatment appropriate to them, but need not be considered in this connection.

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*THE PRESENT ASPECT OF THE ANTITOXIN TREATMENT OF DIPHTHERIA.**

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The verdict of the statistical inquiries of the antitoxin treatment of diphtheria of today shows little change from that of the

*Read before the Philadelphia County Medical Society, April 24, 1901.

original collection of cases made in the first three years of its use, and what difference exists is in favor of the remedy. An elaborate analysis of these reports would be out of place in this paper, but it may be well to give the figures of some of the leading statisticians since the publication of the first series in 1894. Baginsky (Nothnagel's System) reports 1500 cases in hospital and private practice, and says that the fall of mortality has been from 41 per cent to 8 or 9 per cent. The report of the Clinical Society of London (1898) places the preantitoxin death-rate at 29.6 per cent, and that of the antitoxin period at 19.9 per cent. Probably the most complete statistics are found in the monograph of Bayeux. He has analyzed 200,000 cases with a death-rate of 16 per cent. Biggs in 1896 published the most complete collection in our own country. Some consideration of his figures may be of interest. In 158 reports he collected 24,768 cases with a death-rate of 16 per cent. The accordance of his conclusions with those of Bayeux is striking. From the same reports Biggs estimates the preantitoxin death-rate at from 68.7 to 25 per cent. In these tables the hospital cases number 15,560, death-rate 19 per cent. The cases in private practice number 9208, death-rate 10.1 per cent. From a comparison in forty-five double series of cases, in which one portion was treated without the remedy, and one with it, the results are as follows: The death-rate of the antitoxin cases was 19.1 per cent, and that of the non-antitoxin cases 37.8 per cent. The day of the disease upon which the injection was given was recorded in 10,425 cases, in which the mortality was 16 per cent. When the remedy was given upon the first day the death-rate was 3.5 per cent; upon the second day, 8 per cent; upon the third and fourth day, 17 per cent. After the fourth day the death-rate was 34.6 per cent.

It is pleasant to turn to the figures of the committee of the American Pediatric Society, embracing 5576 cases (moribund cases excluded) collected mostly from the private practice of American physicians, including two rather short series from the hospitals of New York and Chicago. The mortality was 8.8 per cent.

Cases injected upon the first day gave a death-rate of 4.9 per cent; upon the second day, 8.6 per cent; upon the third day, 12.7 per cent; upon the fourth day, 22.9 per cent; and after the fourth day, 38 per cent.

The result of this report compares favorably with any that has been published in this country or in Europe.

To illustrate the importance of the need of the early administration of the antitoxin, Baginsky's figures are even more striking. Cases injected upon the first day gave a death-rate of from 1.07 to 2.7 per cent. Cases injected upon the second day gave a mortality of 5.7 to 14.1 per cent. The study of these and other figures has led to the following conclusions:

1. Under the use of antitoxin the death-rate has been reduced in round figures to about 16 per cent against a former death-rate of from 65 to 25 per cent. In favorable circumstances the mortality is 8 per cent or lower.

2. The death-rate varies greatly according to the promptness with which the remedy is given. It falls to 3 or 5 per cent in cases injected upon the first day, and increases rapidly until it reaches 35 or 40 per cent in cases in which injection has not been made before the fourth day or after.

3. Results in hospital practice are much less satisfactory than those in private practice. The reason for this is probably that in the former case the patients are seen and injected earlier, probably come from better hygienic surroundings, and show correspondingly greater resistance.

Laryngeal Cases.—In studying the figures of laryngeal diphtheria, one is forcibly struck with the fact that the greatest benefit that antitoxin has conferred upon this form of the disease is the reduction of the number that require operation, though its favorable influence upon the percentage of recoveries in operative cases is very decided. Biggs's figures are as follows: In 15,148 cases of laryngeal diphtheria the death-rate was 16.6 per cent against a preantitoxin death-rate of 70 per cent. Of these 12,066 were non-operative (79 per cent of the total), with a death-rate of 12.7 per cent; 3082 were operative (21 per cent of the total), with a death-rate of 26.7 per cent. The tracheotomies numbered 1355, death-rate 42 per cent; intubations 1173, death-rate 30.8 per cent.

The figures of the American Pediatric Society are 1704 cases of laryngeal diphtheria with a death-rate of 21.12 per cent. There were 668 operative cases (39.21 per cent of all cases), death-rate 27.24 per cent, and 1036 non-operative cases (60.79 per cent of

all cases), with a death-rate of 17.18 per cent. The American Pediatric Society estimates that formerly the percentage of the cases of laryngeal diphtheria which required operation was 90. These figures show that it has been reduced to 21 per cent to 40 per cent and that the lower percentage has been deduced from the larger series of cases. The mortality formerly has been estimated at 73 per cent; the recoveries now number 73 per cent. The figures are reversed.

The Lesions of the Heart, Kidneys, and Nervous System.—Symptoms of heart weakness, albuminuria, and paralysis are probably considerably more common since the beginning of antitoxin treatment than in the preantitoxin days. At first, as was natural in the use of a strange and new remedy, this was attributed to the antitoxin itself. A more thorough study of the pathological anatomy shows the fallacy in this, however, and renders the increased percentage of complications an argument for the more vigorous use of the remedy, and emphasizes the importance of its use at the earliest possible moment. The classical monograph upon the Pathology of Diphtheria, recently published by Councilman, Mallory, and Pearce, confirms the scattered observations hitherto recorded, and classifies our knowledge of the subject so as to enable us to state beyond doubt that the visceral complications are produced, not by functional disturbances, but by the actual organic changes in the tissues brought about by the necrosis-producing properties of the toxin.

Again, owing to the reduced mortality, numbers of cases recover that would have died in the preantitoxin days. It is self-evident that these cases belong rather to the severe than to the mild variety, and owing to the lateness of the administration of the antitoxin, or to the severity of the infection by the Klebs-Loeffler bacilli, the toxin has had an opportunity to cause necrosis in the tissues before the antitoxin could stop the formation of or neutralize the toxin. The antitoxin can only arrest such necrotic processes by removing their cause, and has no power to bring about regeneration of the tissue already destroyed. That these cases will suffer from visceral complications is self-evident, as is also the fact that in this way the percentage of such complications will be higher in the non-fatal cases treated with antitoxin than in those of the preantitoxin times.

Kidneys.—The percentage of cases showing albuminuria during the course of the disease depends upon the promptness with which the antitoxin is administered. The figures of the Metropolitan Asylum Boards of London in 1879 are as follows: Pre-antitoxin percentage, 24.1; antitoxin percentage, 41.5; while during the same period the mortality had fallen from 29.6 to 22 per cent.

Heart.—Baginsky makes the significant statement that in preantitoxin times only 26 per cent of the cases with milder cardiac symptoms survived, while under the antitoxin treatment the percentage is 49. In his experience the heart symptoms were milder in the antitoxin cases.

In the report of the American Pediatric Society there were thirty-two fatal cases of cardiac failure during convalescence. Only one of these occurred in the cases injected upon the first day, two in those treated upon the second day, and twenty-five in those injected on the third day or after. In four the date of injection was unknown.

The following case was under the care of Dr. Musser and myself, and is interesting as illustrating the fact that the early injection of antitoxin can so protect the myocardium of a heart which was the seat of severe valvular lesions and dilatation that the case recovered without signs of undue cardiac weakness.

Mina S., aged nine years, had suffered from valvular heart disease for several years, following an attack of rheumatism. The heart was much enlarged to the right and left, and there were loud systolic and presystolic murmurs at the apex, and a systolic murmur at the aortic area. The child was anemic, bedridden much of the time, and showed the general symptoms of insufficient cardiac compensation. She developed a true diphtheria of both tonsils, confirmed by bacteriological examination. On the evening of the second day she received 1250 units in two doses. In twenty-four hours the temperature fell from 101° to normal. The heart grew steadily stronger. She made a rapid convalescence without complication, and without arrhythmia or signs of cardiac failure.

Paralysis.—It is probable that antitoxin treatment has not materially affected the frequency of occurrence of postdiphtheritic paralysis. The preantitoxin percentage was from 11 per cent (Sanné) to 14 per cent (Lennox Browne). The percentage of the

American Pediatric Society in 3384 cases was 9.7 per cent. Here twenty-eight cases occurred in patients injected upon the first day, seventy-three and seventy-six in those injected upon the second and third day respectively. The experimental work of Ranson upon rabbits shows that paralysis may be expected after one-quarter of the minimum fatal doses of diphtheritic toxin, and can be averted only by large doses of antitoxin given within the first twenty-four hours.

Dosage.—In the first days of its administration the dose of antitoxin was small and varied from 600 units (Baginsky) to 1000 units (American Pediatric Society) for mild cases, and about 1500 or 2000 units in severe and laryngeal cases. Musser recommends small doses frequently repeated, and gives 500 to 1000 units every six hours until the symptoms are controlled. The English dose was considerably larger, and arouses our suspicions that their serum was not of the standard that it claimed to be. At all events, with their tremendous doses their results, at least at first, were uniformly less satisfactory than those obtained in America or upon the continent.

As the quality of the serum improved and tended to become more uniform, it was used with more confidence, and as it was found that larger amounts could be given with impunity, the general tendency has been to employ larger doses. The consequence of this is, that one injection given early and containing 1500 to 2000 units is usually sufficient to control the disease, and second injections are not so frequent as formerly. I think, too, that not much modification is made for age, as the greater susceptibility in young children requires a relatively larger dose. Laryngeal cases usually require 2000 to 4000 units as an initial dose. In a recent paper McCullom, of Boston, recommends a minimum initial dose of from 4000 to 6000 units, and in serious cases this is repeated at four-hour intervals until the symptoms are controlled. He seldom gives less than 20,000 units, and oftener more than 70,000.

Immunity and Quarantine.—The value of antitoxin as an immunizing agent has been well established. Biggs collected 17,516 cases, of which 129 were mildly attacked in thirty days; twenty were attacked after thirty days; and in all there were two deaths. There are no reliable statistics available to show how long this immunity lasts—indeed, the difficulty in obtaining suitable data is very great. Baginsky places this limit at three weeks. Abbott says it probably does not last longer than a few weeks at most. The dose which was originally placed at 200 to 500 units has advanced so that now from 500 to 1000 units are more frequently given.

The following experience in the Presbyterian Hospital during the past winter is of interest in this connection. In the early part of January three or four cases of diphtheria occurred in the children's department, a large circular ward. The question of preventing further cases arose, and the aid of the Clinical Laboratory was requested. A certain portion of the cases received immunizing doses of antitoxin. The writer suggested that cultures be taken from the throats, not only of the patients but of the nurses as well. This was done with the following result: Upon January 17 cultures from seventeen patients and two nurses showed Klebs-Loeffler bacilli in five patients and one nurse. No more cases developed, and upon January 26 cultures were taken from four nurses and ten patients; three of the nurses showed pure cultures of Klebs-Loeffler bacilli, and three patients the presence of the bacilli in good numbers. At no time was there any evidence in these cases of the clinical presence of diphtheria. This was a striking example of the well known fact that the Klebs-Loeffler bacillus may exist in apparently healthy throats. It has been frequently shown that bacilli may exist for long periods in the throat of convalescents. Thus the average duration in the experience of the bacteriological laboratory of the Philadelphia Board of Health was twenty-nine days from the time of their first observation, with a maximum of 112 days. In the bacteriological laboratory of the Denver Board of Health the average was twenty-two days and the maximum 145 days. The lesson that it seems to me should be drawn from these facts is:

In preventing the spread of diphtheria in any collection of individuals who have been exposed to the disease, the immunizing power of the diphtheritic antitoxin should always be employed, with the additional measure of isolation, and the frequent bacteriological examination of the throats until the absence of the Klebs-Loeffler bacillus in all is definitely proven. The reason for this is that in some cases it is very probable that the virulence of the bacilli in the throat may outlast the duration of the immunity given

by the antitoxin. It is doubtful whether the simple establishment of immunity by antitoxin would be sufficient in many cases to stamp out the epidemic, and thus the employment of these other two measures, particularly isolation.

A successful clinical remedy to rid the throat of diphtheria bacilli is that suggested by Hand, namely, swabbing on three successive days by a fresh solution of silver nitrate of the strength of one drachm to one ounce.

A comparison of the statistics of the four principal cities of the United States is as follows: In Chicago the death-rate from diphtheria per 100,000 of the population for the ten years 1886 to 1894 was 12; from 1896 to 1898, 5.2. The year 1895 was a transition period and cannot be fairly included on either side. In the period from October, 1895, to February, 1898, 4071 cases were treated by the city with antitoxin, with a death-rate of 6.5 per cent. In New York the deaths from diphtheria per 100,000 of population, from 1886 to 1894, was 15.1; 1896 to 1898, 7.1. The death-rate of reported cases of the disease in 1890 was 25.9 per cent; in 1896 it was 15.2 per cent. The health inspectors in 1896 treated 1172 cases with a death-rate of 10 per cent.

In Boston, deaths per 100,000 of population were: 1886 to 1894, 11.8; 1896 to 1898, 10.9. In the South Department of the Boston City Hospital up to 1899, 7657 cases had been treated, with a death-rate of 12.9 per cent.

In Philadelphia, deaths per 100,000 of population were: 1886 to 1894, 10.1; 1896 to 1898, 10.7. The average death-rate of reported cases: 1890 to 1894, 29.68 per cent; 1896 to 1900, 23.6 per cent. The number of cases treated in the Municipal Hospital was: 1896 to 1899, 3985; death-rate, 24.3 per cent; previous death-rate in 1892 to 1894, 25.06 per cent. There have been comparatively few cases treated by the health inspectors.

While in the preantitoxin period Philadelphia's deaths from diphtheria per 100,000 were less than in the other cities, the rate has slightly increased under the antitoxin treatment. We appear at a disadvantage, moreover, in the percentage of deaths to reported cases, and show a fall from 29 to 23.6 per cent only. The figures of 1900, however, show a death-rate of 17.19 per cent. This is a decided improvement and gives hopes for the future. Again, we lack the organized corps of inspectors whose duty it might be to give the antitoxin gratuitously. The brilliant results obtained in New York and Chicago from such an arrangement should be an incentive for our municipal authorities to do likewise.

When the returns of the cases to which antitoxin has been administered is published, Philadelphia will doubtless bear favorable comparison with the other cities of the country.

But when all this is said the fact remains that the general city death-rate from the disease is not as satisfactory as it should be. With our facilities for diagnosis in our city bacteriological laboratory and our reputation as a medical center one must feel chagrined that our profession as a whole have apparently not employed the antitoxin treatment with the confidence and energy that are necessary to bring out its life-saving power.

The unfavorable comparison that must be drawn when the statistics of the Municipal Hospital are brought side by side with other hospital death-rates may be accounted for in several ways. Of course, hospital figures are always worse than those of private practice for reasons given above, but our average death-rate of twenty-five per cent is higher than those of other similar institutions here or abroad. In one report of the Municipal Hospital (1896) the statement is made that a number of cases were included in the diphtheria death-rate that were complicated by measles or scarlet fever. In the reports of other years it is not stated whether or not this was the case. Of course, statistics that contain such mixed cases cannot be fairly compared with series of cases of uncomplicated diphtheria.

Again, in every year a certain number of patients did not receive antitoxin. These individuals, it is stated, came under two classes: (1) very mild cases, and (2) moribund cases. In most lists the latter are rightly excluded, and of course the question as to whether very mild cases should receive the remedy or not is one to be decided by the authorities in charge; but if they were included the death-rate would of course be somewhat lower, and lists from which these favorable cases are excluded cannot be used with fairness in determining the value of the antitoxin treatment.

*A CASE OF TEA-INTOXICATION WITH SPINAL SYMPTOMS.**

By Alfred Gordon, M.D.,
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Mrs. A. B., married, thirty-one years of age; pedler by occupation. Her father enjoys good health and is seventy-eight years of age. Mother is sixty-eight years old, but always ill. One sister of thirty-nine is also constantly ill. One brother of twenty-nine is in good health. Mother had several miscarriages.

Personal history: Was operated upon seven years ago for a tumor of the uterus, and since then has not menstruated. Eight months later she began to suffer with pain and stiffness in lower limbs. Before the operation she used to drink about ten cups of tea daily, but for the past two years drank about forty-five large glasses (360 ounces) a day. The tea was always black, and extremely strong; sometimes she drank it in infusion, but most of the time in decoction. She has been a pedler for the past three years, and is constantly exposed to cold. When she had no means to buy goods, she used to do any other work she could procure, which most of the time was very hard. For the last ten years she has complained of weak eyesight, which has become still weaker during the past three years, so that she was compelled to wear glasses.

The symptoms the patient presented three months ago when she was first examined could be divided into two groups: symptoms of combined sclerosis, and symptoms of functional disturbances. The symptoms of combined sclerosis consisted in ataxia of the legs and arms, Romberg's sign, dull pain in the lower limbs, and also sensation of numbness in the thighs. There was no girdle sensation. She had a sense of fatigue in her limbs, and on the slightest exertion became very tired. There was unsteadiness in walking and slight rigidity in lower extremities, but none in upper. She had very much exaggerated knee-, wrist-, and elbow-jerks, which were more marked on the right side than on the left. At each stroke of the patellar, biceps, or triceps tendons a pronounced reflex was followed by repeated clonic movements of legs and forearms—what might be called a knee-, wrist-, and elbow-clonus. Bechterew's reflex was exaggerated on both sides, but more marked on the right side. Babinski's sign was absent on both sides. The sphincters were involved: frequent and imperative micturition and constipation were very marked.

The examination for sensations gave the following results: Thermal sensation was normal all over the body. Tactile sensation was preserved in the lower extremities, hands, and lower two-thirds of forearms; above this up to the shoulder patient could not distinguish a blunt instrument from a sharp one. Sensations to pain were different in the lower and upper extremities: in the first we noticed hyperesthesia, in the last hypoesthesia, more marked on the right than on the left side; it was the same with the face; the right halves of the tongue and pharynx were much less sensitive to pain than the left. The same disturbance was found on the chest.

The eye examination gave the following results: Pupils unequal, right larger than left; right reacted very sluggishly to light; left pupilary reaction normal. Nystagmus present in both eyes; left internal rectus muscle paretic. She had a high error of refraction, hypermetropia. Fields were taken with difficulty; she was unable to look straight before her more than half a minute. Repeated examination showed slight narrowness of the visual field for the right eye. The eye-grounds showed a slight congestion of the disks.

As far as functional disturbances are concerned, the patient was excitable, and when she became angry she fainted—to use her own expression. She did not lose consciousness, but was unable to move her arms and legs for fifteen minutes. About three weeks ago, subsequent to a fright, she suddenly became deaf. The ear examination revealed nothing abnormal. Her mental condition was perfect; memory excellent, no hallucinations, no nightmares; sleep was fairly good.

The examination of the viscera revealed nothing abnormal, except that the first sound of the heart was slightly accentuated. The patient appeared to be anemic. She has wasted a great deal within the last two years.

Under treatment in three weeks she improved considerably in regard to her functional disturbances, but the spinal symptoms remained as before the treatment.

An examination made a few days ago gave the following changes of her previous

*Case exhibited before the Philadelphia Neurological Society, April 22, 1901.

condition: Walking with closed and opened eyes was very much better, but standing with open or closed eyes remained the same. The ataxia of the arms, which was very marked at the first examination, had almost disappeared. At the beginning of the treatment we suppressed the tea entirely, and patient improved in regard to her functional disturbances; she felt stronger, was quieter, and was much less emotional. But her abstinence did not last long; she drinks now on an average fifteen glasses (120 ounces) of tea daily, and she feels as heavy on her feet as ever; also the marked rigidity noted three months ago is better now. She says that her legs are so heavy that she is compelled to ask some one to lift and put them on a chair; to go up-stairs is very difficult for her.

Summing up the case, we see that the patient presents undoubted symptoms of posterior and lateral sclerosis, except Babinski's sign and ankle-clonus, but the patient has knee-, wrist-, and elbow-clonus instead. On the other hand, the hypoesthesia on the right upper half of the body, including face, palate, and pharynx, would rather make us believe in hysteria, if in addition to it we take in consideration the fainting spells without loss of consciousness and the emotional state of the patient's character. This would go hand in hand with the hyperesthesia of the lower extremities, and even the exaggerated knee-jerk. But what is against this theory is the ataxia of the legs and nystagmus. As to the involvement of the sphincters, this could be of spinal origin as well as of a functional character. Our patient was certainly intoxicated by tea, as we can hardly admit that such an enormous amount of this beverage could leave the nervous system unharmed.

Spinal symptoms produced by tea intoxication are not reported, at least in the literature for the last five years. All reported cases have reference to cerebral symptoms. Wood (*Medical News*, 1895) reports a case where theism produced headaches, neuralgia of face and neck, attacks of vertigo, mental disquietude and confusion, forgetfulness, periods of despondency, restless sleep, nightmares, dreams, hallucinations. Cooney (*Indian Medical Record*, Calcutta, 1897) observed palpitation of the heart, headache, giddiness, mental depression, melancholia, suicidal monomania. Castle (*Cincinnati Lancet-Clinic*, 1886) experimented on himself with theine and stated that besides local loss of sensation, he had psychic disturbances, confusion of ideas, excitability, fainting spells. Thomas J. Mays (Theine in Treatment of Neuralgia, Philadelphia, 1888) has not observed symptoms of cerebral intoxication, but he did observe symptoms of anesthesia. Lehman and Tendlan (*Arch. f. Hyg.*, München, 1898) undertook a long series of experiments and stated that 20 to 40 grammes of tea produced muscular spasms, muscular fatigue, muscular restlessness and tremor, giddiness. Amblyopia was noticed in tea-intoxication by Campbell (*Lancet*, 1898). We therefore see from these few cases that there has been no mention of spinal symptoms. Shall we reject the possibility of influence of the elements of tea on the cord?

Theine and essential oils of tea are poisons to the nervous system. On the other hand, Schwann demonstrated that tannic acid will leave a precipitate from digestive elements and render them inert; atony of bowels and stomach is the result; autointoxication might follow. Cooney says that black lead is used to give a bloom to black tea. We therefore see that three sorts of poisons, if not more, take part in intoxication by tea. If other intoxications, like alcohol, lead, mercury, etc., are apt to produce spinal symptoms with involvement of the cord, we believe that the same might be expected from tea; it seems to me there is only a difference in degree.

If from the history of the patient the spinal symptoms cannot be attributed to any other cause, and as we find here an extreme abuse of a beverage, we are led to attribute them to tea-intoxication. As to the disturbances of sensations, they might be of hysterical nature, although no other stigmata were found. The patient perhaps always was hysterical, and it is easy to understand how a fluid containing intoxicating principles absorbed in an unusual quantity for several years, and therefore circulating daily in the blood-vessels, could develop hysteria and spinal symptoms in a patient who is predisposed to nervous diseases. The predisposition is present here on account of hard labor, unhygienic conditions of life, and perhaps artificial privation of the genital organs. It is also possible that the spinal symptoms were to some extent present previously to the abuse of tea; the last circumstance, perhaps, hastened the development of the symptoms, and in addition gave place to

hysteria. At any rate, in our mind the intoxication in question played a certain rôle in the existence of all the symptoms combined. The only remarkable feature in our case is the fact that cerebral symptoms are not marked, and the majority of those mentioned by other writers are totally absent.

I wish to express my indebtedness to Dr. John Wanamaker, 3d, for his kind assistance in taking the history of the case.

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*HEPATIC INADEQUACY AND ITS RELATION TO IRREGULAR GOUT, WITH SPECIAL REFERENCE TO TREATMENT.**

By I. Burney Yeo, M.D., F.R.C.P.,
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When your excellent honorary secretary, Dr. Sunderland, conveyed to me your complimentary invitation to address you this evening, I hesitated as to whether I could find any subject, connected with the special work of this society, that would be worthy of your attention; and when I looked through the reports of your previous meetings and saw what excellent work had been done at them, my feelings were much like those of the celebrated American author who, lamenting the fate of modern novelists, complained that "all the stories had been told!" But I was struck with a remark which fell from Dr. Fortescue Fox at your inaugural meeting: he stated that "a very eminent medical man" said to him that the spa physician had "an unrivaled field for the study of chronic ailments." This is so just and true a remark that I will ask you to regard what I shall say to you this evening as intended merely as a gentle irrigation of the vast field you cultivate. The late Sir Andrew Clarke used to say that the London consultant practiced under, in some respects, great disadvantages. It was so difficult for him to learn the results of his advice. "If," he said, "your prescription cures the patient, he *rarely* returns; if it fails to cure him, he *never* returns." Now your patients cannot as a rule escape you in this way.

I have heard of physicians at continental spas visiting their patients in their baths—they could hardly escape then. But without paying visits of this intimate kind, it is certain that you have exceptional opportunities for carrying out a very thorough investigation of the cases that come under your care.

It is then as an appeal to your experience and as a suggestion for further observations, under these favorable conditions, that I propose to put before you a few thoughts, prompted by my own observations, on the subject of what I suggest may be termed "hepatic inadequacy."

By hepatic inadequacy I mean such defect or disturbance of the functions of the liver as, while stopping short of giving rise to what are known and generally accepted as diseases of the liver, yet leads to impairment of the general health. And I shall possibly trespass on somewhat controversial ground, for I shall include in this category many, if not all, of those cases known or spoken of as cases of "irregular gout," which I am inclined to believe arise in this way. But I wish it to be understood that all I have to say on this head is suggestive and not dogmatic. You, who necessarily see so many of these cases and have such ample opportunities for investigating their histories, analyzing their symptoms, and controlling their treatment, will fortunately be most competent critics of the views I shall put before you.

I should like it also to be understood that these views are founded mainly, if not wholly, on clinical observations and practical experience, and that I strongly hold the opinion that when such observations are found to be inconsistent with laboratory experiments and theories founded on them, that the clinical observations, if sound and accurate, must always be supreme.

It is necessary to insist upon this, because it seems to me that some of the ablest scientific workers in this field have become, as it were, fascinated by their own theories and experiments, and have overlooked the obligation of making their conclusions accord strictly with the facts of clinical medicine and clinical therapeutics.

Moreover, the results obtained and the views held by different experimenters differ widely, according to the methods they adopt, according to their confidence in those methods, and sometimes, it seems to me, according to their preconceived ideas. Therefore I maintain that those of us who base

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*An address delivered at the annual meeting of the Balneological and Climatological Society of Great Britain.

our conclusions on clinical observations have the right—I would say the obligation—to criticize any doctrines and conclusions, put forward as the result of laboratory investigations, which do not accord fully with our actual experience of the particular morbid states concerned, as we see them in living men.

If you were to attempt the task of reading all the reports of the many experimenters who have worked at the subject of gout, you would find their results to be a perfect maze of contradictions, as irritating to the brain as the hypothetical showers of uric acid crystals in which some of them seem to believe.

Observation *in vitro* may be mutually destructive of opposing theories, but they can never be regarded as decisive of vital operations unless they are, in all respects, consistent with clinical, *i. e.*, with vital, facts.

Now I propose to suggest to you that in the chronic ailments which we are accustomed to recognize as cases of "irregular gout," the clinical evidence, both with regard to the symptoms and the results of treatment, seems to point to hepatic inadequacy as being the initial cause of these morbid states. And I think it is reasonable to infer either that these cases are improperly termed "gout," and should be termed instead cases of "hepatic inadequacy," or that "hepatic inadequacy" is the original cause of gout, and that the manifestations of regular and articular gout are the result, near or remote, of the disturbances in metabolism thereby initiated.

It has always appeared to me that clinical evidence has been opposed to the conclusion that all or the greater part of the phenomena of gout, as we now see them, are the result of uratic precipitation in the tissues, and that the widely spread and popular idea that the treatment of gout consists in the administration of so-called "solvents of uric acid" is an erroneous one—not only erroneous, but in the way it is now "boomed" positively injurious.

Nor have I been able to find any sound clinical basis for the doctrine which was advanced I believe originally by Sir William Roberts, and has been most ably supported by your learned treasurer, Dr. Luff, that sodium salts are injurious to gouty persons, and that alkalies are useless in the treatment of gout.

Sir William Roberts himself admitted that uric acid "did not cover the whole field of gout," and Professor Bouchard has insisted strongly on this; and I would add that uric acid not only "does not cover the whole field of gout," but we know it spreads widely over other pathological fields which have nothing to do with gout. For my own part I have great doubt whether uric acid has any other relation to gout than that its overproduction in the human body is a result of the "gouty" state—a state which I would suggest takes its origin in disturbed hepatic metabolism. This contention is an important one from the point of view of therapeutics, as it must modify greatly our ideas as to the appropriate treatment of the gouty state, and especially our views as to its prevention. And it is, I consider, most important that we should observe and carefully analyze all the clinical phenomena of gout, and the "gouty" state, with minds unfettered by preconceived chemical theories.

Without for one moment desiring to detract from the importance to medical science of physiological and chemical research, yet I think it is not always so helpful to clinical medicine as it might be, unless it is carried out in what I would call a clinical spirit, and not with the object of dogmatically imposing its conclusions on the clinical physician. It is sometimes difficult to distinguish between the resulting facts of a research and the mere opinions of its authors. An apt illustration and example of the truth of these statements may be found in the effect that was produced some thirty years ago by the publication of the Edinburgh Committee's research on the action of mercury on the liver.

The supposed results of this research, put as briefly as possible (I quote from the report), were that mercury, "so far from increasing the flow of bile, causes its diminution, through its general depressing effect on the entire organism," and, the reporter adds, "the practical advantage of demonstrating that mercury is not a cholagogue cannot be too highly estimated."*

The immediate effect of this report was that medical practitioners were afraid to order a dose of calomel or of blue pill for fear of being thought unscientific. A number of comparatively new drugs—podophyllum, euonymin, iridin, and others—came into fashion and were prescribed instead of the much discredited calomel.

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*Medicine in Modern Times. Macmillan, 1869; pp. 233-235.

But after a time practical men found that they could not get on without calomel or blue pill; and the late Dr. Hare, in an address given in 1883 before the Metropolitan Branch of the British Medical Association, on "Good Remedies—Out of Fashion," made the following remarks: "I am quite aware of the experiments by which it has been proven, or said to have been proven, that mercurials are not cholagogues, but this I know, that a good dose of calomel or blue pill, given in the olden fashion, and followed by some sulphate of magnesia or other good saline purgative in the morning, will bring away copious motions of yellow, green, or black matter, *such as you do not get otherwise,* and one feels, after that, light and buoyant and bright, and with a head clear for work, a state such as one has not felt in perhaps for weeks before; the melancholy—the black-bile—has been removed."

Now what, after thirty years, is the teaching of physiologists, in the present day, as to the action of calomel? It is that although calomel does not really cause an increased formation of bile, it acts on the bile-expelling mechanism and promotes the flow of bile into the intestines, there to carry on the chemical and other changes in the intestinal contents which it is known to produce; and it necessarily also promotes its elimination. Is this not an important effect? Was more than this claimed in calling calomel a cholagogue?

Is it a small matter to clear the bile passages of possibly thick, viscid bile and mucus, when perhaps there is also some slight catarrh of the bile-ducts? Is it a small matter to clear the way for a fresh onflow of bile along the natural passages, partially obstructed by a languid current? Well, we now no longer hesitate to prescribe calomel for fear of being thought "unscientific." I do not think I am saying too much when I say we know it promotes, indirectly, if not directly, the hepatic functions, especially the excretory functions of the liver, and that it is a remedy for "hepatic inadequacy."

A patient of mine, a "gouty" patient, a few years ago went for a course of treatment to one of our famous English spas. She was treated by a physician of eminent skill and repute, a distinguished member of this society. When she returned, greatly improved in health, she told me that physician had given her, besides the waters she drank, a calomel pill every or every other night! Evidently he was not of the opinion of the Edinburgh Committee, that "the practical advantage of demonstrating that mercury is not a cholagogue cannot be too highly estimated."

Indeed calomel is, I should say, nowadays used as extensively as ever it was in the treatment of chronic disease, especially in functional disorders of the stomach and liver, in which I venture to include many forms of so-called "irregular gout."

I find in Martindale's interesting analysis of recent prescriptions that podophyllin was prescribed 189 times, euonymin 238 times, and calomel 837 times!

Now there is another inquiry to which I think you might advantageously devote the special means of practical observation which you possess, and that is, What is likely to be the effect on practical medicine of the recent experimental impeachment of the use of sodium salts and alkalies generally in the treatment of gout and the gouty state?

Have all the physicians of the world been wrong in sending their gouty patients to drink alkaline waters rich in sodium salts? Have we all of us who have any tendency to gout been daily provoking the precipitation of sodium biurate in our tissues by drinking freely of those common table waters containing sodium bicarbonate which are so popular? Have all persons with gouty antecedents, in which I should have to be included, been wrong in taking sodium chloride with their food? Then I would ask you to remember that sodium chloride and sodium bicarbonate, and other sodium salts, are *always* present in normal blood, and if these are the agents in the precipitation of sodium biurate in the tissues, they are always there in the blood to effect that undesirable result, whether we do or do not take them into the stomach in the shape of food or medicine; and obviously they must normally reach the blood through the food we take. But the chemical argument assumes this form: those who give sodium salts and other alkalies in gout do so in the belief that they dissolve uratic deposits in the body, and as it can be shown that out of the body they do not do so, therefore this practice must be wrong.

To this argument I reply that so far as I am concerned I do not give these salts with any such object, save in the case of urinary and renal uratic deposits, in which their utility has never, I believe, been seriously doubted. I give them because I believe they are most useful—especially the sodium bi-

carbonate—in promoting the healthy function of the liver and in favoring metabolism generally. I believe the alkalies do this, to some extent, by promoting osmosis. Physiologists appear to be agreed that sodium chloride, "in passing through the body, fulfils the useful office of stimulating metabolism and secretion."*

Many of you must have noted the rapid effect of drinking a warm solution of sodium bicarbonate in thinning the tenacious mucus secreted in the so-called "dry" or "gouty" catarrhs of the air passages. It is the best expectorant we possess for this purpose, especially when combined with sodium chloride. This is, as you know, the explanation of the well known value of Ems water in the treatment of such cases. It certainly also promotes the flow of urine and doubtless also the flow of bile.

The remarkable effect of solutions of sodium salts on the hepatic functions is shown by their curative effect in "gouty" and dietetic glycosuria. The remedial influence of the alkaline sodium waters of Carlsbad, Neuenahr, and Vichy on such forms of diabetes cannot be disputed. We must all have seen numerous instances of their remedial action in other forms of so-called "gouty" disorders.

When, a good many years ago, I was house surgeon to a county hospital, the chairman suffered from chronic gout and renal colic; he used to go for relief to Vichy, and he was in the habit of showing me, on his return, in a bottle, some dozens of roundish concretions of uric acid which he parted with during his course at Vichy.

I will mention another, quite a typical case, and one of many. A gentleman over middle age was sent to me by his country doctor in June, 1894, as suffering from "gouty" headaches of a severe kind, which had tormented him for many years, and he wished me to advise him as to what spa he should visit. I advised him to go to Marienbad. He went there for five consecutive years, drinking these waters, rich in sodium salts, with entire relief to his headaches, and he is returning there this year.

Another gentleman, who has been under my observation for more than twenty-five years, a member of a gouty family, and who has been most anxious to avoid similar gouty troubles himself, to this end, for more than a quarter of a century, has dosed himself with alkalies daily—sodium bicarbonate chiefly, but also potassium bicarbonate, and magnesium carbonate. He is an exceptionally large eater, taking much animal food, which he firmly believes he needs to "support his system." He frequently drinks at meals champagne or port diluted and in moderate quantity. His urine is almost always faintly alkaline and is passed in considerable quantities. He has never had any true gouty attack nor any signs of uratic precipitation. He is now sixty years of age, and he considers that in the past five years he has been in better health than at any period in the last twenty-five years. He is a scholar and an acute logician. If you were to ask him, on theoretical grounds, to leave off his soda and other alkalies, he would argue that he owes to them his freedom from goutiness and his ability to digest large quantities of animal food which he needs for his support, and that he owes his present good health to taking them.

Again, those who accept this experimental argument against the use of sodium salts in the gouty might be tempted to starve the blood of these its necessary constituents, and so disturb seriously the processes of general metabolism. Even if we were to accept this explanation of the mode of precipitation of sodium biurate in the joints, it only explains an incident of gout, an incident which we know does not always occur, and an incident which we also know may occur without giving rise to any of the symptoms of gout. I have often seen uratic deposits on the helix of the ear in persons who have never had any knowledge of having suffered from any of the symptoms of gout.

But the true pathogeny of gout must be sought for in some disturbance of function antecedent to the accumulation of urates in the blood, which accumulation occurs in other diseases besides gout; and I believe it will be found in disturbances of hepatic metabolism—in short, in hepatic inadequacy.

We may therefore believe that sodium salts exert their remedial influence by a beneficial action on the gastric, intestinal, and hepatic functions, and on the nutritive changes in the tissues, quite irrespective of any direct solvent action on sodium biurate. By their action on the liver they may prevent "the excessive introduction of urates into the circulation," or by their stimulating action on the kidneys they may counteract the tendency to their "unduly lingering in

*Halliburton's Kirkes' Physiology, p. 545.

the blood and accumulating therein;" so that their influence may be in the truest and best sense remedial, inasmuch as they would attack the morbid processes at their origin and source.

As to the argument that attacks of acute gout are frequently induced while taking a course of sodium waters, I admit that such attacks no doubt do occasionally occur, but certainly not frequently, and they occur quite as frequently at other spas. Dr. Fortescue Fox has called attention to this fact in the able paper he read before this society on "Articular Gout," where he states he has had to bewail similar occurrences at Strathpeffer. "Bitter experience," he says, "has taught me that the routine treatment by waters and baths, with reduction of dietetic supply and augmentation of waste, whilst it removes the gouty symptoms from one man increases them in another." I have already pointed out that Sir William Roberts has himself maintained that uric acid does not "cover the whole field of gout," and that "if uric acid were altogether eliminated, a pathological entity would still remain and be recognizable as gout."* And Professor Bouchard says: "It has by no means been demonstrated that in gout uric acid is the only or even the chief matter contaminating the fluids . . . many of the chronic lesions of gout are in part composed of or occasioned by precipitated urates; but the disease itself is not due to uricemia."†

If we refer to an American authority on gout—Professor Lyman, of Chicago—we find him convinced of the value of alkaline and sodium waters in gout. He says: "It has been proved that the administration of alkaline waters promotes the flow of bile, and is followed by an increase in the amount and activity of the digestive fluids . . . as a general rule it may be asserted that the salts of sodium are safer and better tolerated than the other alkaline salts;" and he refers to the fact that Charcot and his pupils have given for months at a time an ounce a day of sodium bicarbonate without the slightest ill effect.‡

Then both Professor Bouchard and Professor Lyman call attention to the close relationship between gout and biliary lithiasis. Bouchard found that of one hundred cases of biliary calculi under his observation thirty per cent had gout among their antecedents. It has also been noted that young women who in early life have suffered from biliary colic tend, later on in life, to develop gouty arthritis, and occasionally, after the establishment of articular gout, it happens that its crises alternate with the attacks of colic, "affording a complete demonstration of the close relationship that exists between the two disorders." Now the value of sodium salts and waters in the treatment of biliary lithiasis cannot be questioned.

But it may be asked what are the symptoms referable to hepatic inadequacy presented by patients with irregular gout?

In the first place, the feces are often pale, from the absence of bile coloring matter, and often very offensive; there is often constipation, but sometimes more or less diarrhea.

Some enlargement of the liver may frequently be made out, with tenderness on pressure where it is uncovered.

The complexion is often muddy and the conjunctiva yellowish, and the patients often complain of a sweetish-bitter taste in the mouth and loss of appetite.

The urine is high-colored and often of high specific gravity; I have found it frequently range between 1028 and 1036. It is usually extremely acid, and it gives a color reaction which I have been led to associate with disordered hepatic functions. On boiling and adding nitric acid, various shades of mahogany color are developed, so pronounced in some instances that the urine looks almost as black as ink in the test-tube; while in others there may be only a faint purplish tint.

But this coloration of the urine with heat and nitric acid is very common in the gouty state, and it is also commonly found in functional and malignant hepatic disease.

It has seemed to me that, so far from the kidneys being functionally diseased in these cases, as has been suggested, they really eliminate excrementitious substances that are normally excreted in the bile, and hence this color-reaction. It is certainly not dependent on constipation, because it is not very uncommon to find diarrhea coexisting.

These are symptoms which I suggest go

*Report of Proceedings of the Medico-Chirurgical Society, British Medical Journal, Jan. 14th, 1893.

†"Maladies par Ralentissement de la Nutrition," 2d ed., p. 264.

‡Article on "Gout," in the Twentieth Century Practice of Medicine.

with disturbed hepatic metabolism and imperfect excretion of bile.

Dr. Myrtle has described an aggravated form of this condition in an interesting paper in the transactions of your society under the title of the "Gouty Liver;" but as Dr. Kerr has suggested, I think a better title would be "The Liver in Gout."

I believe also that I am following in the footsteps of that eminent clinical observer, the late Dr. Murchison, in thinking that the initial trouble in gout is disturbed hepatic metabolism.

Now the bile-secreting cells of the liver in some persons seem extremely sensitive to what appear very slight influences, while there can be no doubt as to the intimate corelation between the three great eliminating organs, the liver, the kidneys, and the skin.

A single morphine lozenge will produce pale stools immediately in certain persons; alcohol, emotion, chill, will do the same in others.

A well known statesman used to have a fit of gout, or become "gouty," if he ate a few strawberries! It was doubtless the knowledge of a few facts like this that led the late Sir Andrew Clarke to forbid his gouty patients to take fruit. We know how much more common it is to get attacks of irregular gout during the cold northeast winds of spring. The skin gets chilled and its excreting functions impaired, and this chilling of the skin seems sometimes to be reflected on to the excreting function of the liver, and we get what we have been accustomed to term of late years a "liver chill."

Here again we see a probable connection between liver inadequacy and goutiness.

There is another type of hepatic inadequacy in which I know the members of this society take an especial interest. I might perhaps call it "the liver of the seaside." A very striking case of this kind was sent to me some years ago by my friend, the late Mr. Jowers, of Brighton. A middle-aged American lady had been spending three months at that resort, and had been suffering the whole time from symptoms which were thought to be of an obscure nature by the homeopathic practitioner under whose care she had for some time remained; and as she was getting no better, and becoming extremely anxious about her condition, she consulted Mr. Jowers, who at once ordered her to leave Brighton and come to London.

When I saw her she was in a wretched state of mental depression; she was impressed with the belief that she was most seriously ill and that she would never return to America alive. When I inquired into her symptoms I found she had lost all appetite, that she had headache, a "bad taste" in her mouth, and a flabby, coated tongue; she was constipated, with pale stools; her urine was of high specific gravity, throwing down lithates and becoming of a mahogany color with heat and nitric acid. The liver dulness was somewhat increased, and there was tenderness over its free border in the epigastrium. I reassured her as to the nature of her symptoms, and pointed out to her that she was suffering from what had been called "Brighton dyspepsia," and that she would soon get well now that she had left that place. I gave her some small doses of calomel on alternate nights, a bicarbonate of sodium and nux vomica dose before each of her meals, a glass of Carlsbad water on alternate mornings, and as her heart was very weak from the long-continued dyspepsia and loss of appetite, I got her some very fine old cognac at 25 shillings a bottle, which helped her to recover tone and strength. She soon got better, and a few weeks later in the season I met her in Paris, cheerfully enjoying the legitimate pleasures of that gay capital.

It has been suggested by some members of your society that those symptoms attacking certain visitors at the seaside might be due to the ozone in the air. I do not think so, because I have noted again and again that such symptoms are never observed in anything like the same degree in seaside resorts where visitors can dwell three or four hundred feet above the sea. It is when they are obliged to live near the sea and on a level with it that these symptoms are most prone to arise. I believe it is some subtle influence which checks the activity of the bile-cells, and there is thus developed a form of hepatic inadequacy. What that subtle influence is I do not know; it may be analogous to that which excites asthma in certain places in certain people; for I have known an asthmatic patient have asthma badly at Deal, and when at my wish he moved to Folkestone, only a few miles further west, but not on a level with the sea, the asthma left him while driving from the station to his lodgings in the latter place, and did not return while he remained there.

You will also find that if gouty patients are sent to the Upper Engadine they often

get very uncomfortable in that bracing climate. They lose appetite, become constipated, have pale stools, and if they have hemorrhoids, these become much more troublesome, and their skin sometimes assumes a subicteric hue. If they leave the Engadine, as they should do, and go to a resort on a lower level, they generally soon get well. I have seen exactly the same thing happen at the Riffel-Alp, for these elevated stations are unsuited to the gouty.

But there are physiological reasons, as well as clinical reasons, for incriminating the liver in the production of the gouty state. We know that the liver is specially concerned in the metabolism of carbohydrates (its glycogenic function) and also in the metabolism of nitrogenous material (the formation of urea and uric acid). Halliburton says: "The facts of experiment and pathology point very strongly in support of the theory that urea is formed in the liver;"* and again, "uric acid is not made by the kidneys." Experiments point to the liver as the seat of its formation; "it is probable that ammonia and lactic acid are normally synthesized in the liver to form uric acid."†

We know also that in the gouty one of these functions—the glycogenic—is often disturbed, and is restored by alkaline (sodium) medication. Is it not reasonable to conclude that another function of the liver, carried on side by side with this one, is also prone to be disturbed? for we clinically see it restored by the same means.

Again, another function of the liver is the formation of bile; this is regarded by many physiologists as a subsidiary one, "bile containing the waste products of the liver, the results of its other activities,"‡ and this third function we also find disturbed in the gouty.

Perhaps you will allow me in conclusion to offer, for your consideration, one or two suggestions as to the influence of diet in these cases. Apart from individual peculiarities which are common in the gouty, my impression is that the safest diet for these patients is the simplest diet. It is a mistake to dogmatize about diet for the gouty. We must study their individual dietetic capacities, and adapt the diet to them.

A vegetarian diet may suit some, but it has not fallen to my lot to meet such cases. But I am bound to admit that I have seen the most troublesome gouty headaches disappear and a condition of greatly improved health result from an exclusive, or nearly exclusive, diet of pounded meat with liberal draughts of hot water. I have rarely prescribed this diet myself, but I happen to have been officially brought into contact with those who have been following this mode of treatment, and I have not been able to resist the evidence of its success in some cases, and although in one instance the patient seemed at first to be made very weak and thin, yet he was free from headaches, and after perseveringly following the treatment for some months, ended by finding himself in better health than he had been for many years. Now the reason of the success of this treatment in such cases is, I think, plain. The pounded lean meat diet is about the simplest that can be offered to the feeble digestive organs, and physiologists tell us that "proteid food increases the quantity of bile secreted," and the large draughts of hot water flush the excretory ducts both of liver and kidneys. Extremely simple food, limited in amount, meaning as it does digestive ease, means also freedom from goutiness. I have ventured to paraphrase a couplet of Dr. Watts:

> "Nature finds some mischief still
> For idle food to do!"

To cure goutiness we must get rid of this "idle food"—food which is in excess of our wants, and a trouble to our metabolism.

There is much also in the quality and cooking of food—often more, to my thinking, than in the kind of food. The difference in the wholesomeness and digestibility of different specimens of bread is remarkable, and so it is with joints of meat, poultry, and fish.

I could extend this remark as to quality to wines also. The late Professor Tyndall once told me that an eminent London physician advised him to drink "claret." "But," he said, "I asked him 'what claret?'" So far as my observation goes claret is really one of the most risky wines to prescribe (without regard to its kind) for a gouty patient, and when I see "port" put at the head of a list of wines which induce gout, I am inclined, like Professor Tyndall, to ask "What port?"

One of my gouty patients, who is a fine judge of wines and a very careful liver, has excluded every wine from his dietary, ex-

*Halliburton's Kirkes' Physiology, p. 537.
†Ibid., p. 541.
‡Ibid., p. 487.

cept "port," of which he drinks two glasses daily. He has suffered for many years from gouty headaches, and has had deposits of sodium urate removed from his eyelids; but he has never had articular gout, and keeps in very fair health, and for the last five or six years has had no serious gouty symptoms.

I find a dry port, long in the wood, if it is freely diluted with hot water, one of the best and safest wines for those gouty people who need some stimulant. Gouty women, I find, bear all wines badly.

Many gouty patients can drink a small quantity of a well matured, high-quality wine—even champagne and port—especially if diluted with water, who would be made ill by a single glass of common claret. The more diuretic the effect of the wine proves to be, the more suitable it is to the particular case.

There seems to exist a general impression that the gouty person is one who does not take an adequate amount of physical exercise, and that he must be ordered to take more. Now that is not my experience. The gouty patients that I have seen have, I should say, in the majority of instances, been extremely active and energetic people, and it is often difficult to get them to take sufficient rest. This excess of muscular activity constantly leads them to take an excess of food, and then trouble arises because their excretory organs can hardly keep pace with the waste produced in the body; this is especially notable after middle age, when the activities of the excreting organs become reduced and both liver and kidneys may become inadequate.

A well known physician, returning home from his morning ride in the park, met the late Sir James Paget, and asked him why he did not ride in the morning? "Why should I?" asked Sir James. "Oh, to shake your liver up," replied his friend. "But I don't wish to shake up my liver," said Sir James; and I think there was a great deal of practical wisdom in that reply.

But I must not trespass longer on your kind attention. I have ventured to ask your consideration of some practical reflections as to the relation of the liver to goutiness. As I said at the beginning, I wish to avoid all tendency to dogmatism in a matter which is so open to differences of opinion. But we must also be careful not to be led away by the dogmatism of the laboratory. For chemistry or pharmacology to dictate to clinical medicine is like art dictating to nature. My chief object has been to defend the sodium salts from the attack that has been made on them, because I believe we have in these salts the most valuable and indispensable of hepatic stimulants.

We practical physicians have to observe the phenomena of health and disease as they present themselves in man, and we must not allow any *a priori* chemical arguments to color or prejudice our clinical observations.

Let us be observers and students of nature, but don't let us dictate to her. Laboratory work should be the handmaid of clinical medicine, but clinical facts must not be distorted to accord with laboratory results.

In reading the reports of much of the experimental work that has been published in regard to gout, I have been forcibly reminded of the lines of Omar Khayyam:

> "Myself when young did eagerly frequent
> Doctor and Saint, and heard great argument—
> * * * * * but evermore
> Came out by that same door where in I went."

THE TREATMENT OF THE HEART IN TYPHOID FEVER AND OTHER INFECTIOUS DISEASES.

ABRAMS states that he has of late employed with excellent results, not only in the treatment of typhoid fever and pneumonia, but in chronic diseases of the heart, a procedure which he calls the siphon method. The patient is prepared in the usual manner for taking a sponge bath, and beyond this no disturbance of the patient is necessary. Then a siphon bottle containing the carbonated liquid is gradually discharged over the surface of the body, notably on the thoracic region. If one wishes to comply with the requirements of the Schott system, although stimulation is not so pronounced, the siphon bottle may before use be immersed in hot water until the requisite temperature is attained. Within a few minutes one may note after the employment of the siphon method a reduction of the pulse from ten to twenty beats a minute, which rate is maintained for a varying period of time. The pulse becomes likewise endowed with more strength, and there is a feeling of exhilaration such as rarely obtains after the cold bath. Pulse-tracings taken in a convalescent typhoid patient, with an extremely weak heart, have demonstrated the favorable action of the siphon method.—*Medical News*, March 16, 1901.

The Therapeutic Gazette

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Leading Articles.

THE PREVENTION OF MALARIA.

We have more than once in the editorial columns of the THERAPEUTIC GAZETTE called attention to the very extraordinary advances which are being made in the study of malaria, and which prove that the mosquito is responsible in every instance for the dissemination of this disease, which has until recent years been thought to be due to "miasm" or to some condition entirely disassociated from animal life. The very valuable experiments carried out by Manson, Ross, and a host of Italian investigators have proved beyond all doubt that the mosquito carries the infection to the human being from another human being from which it has originally drawn blood, and we called attention not long since to the interesting experiments carried out by Manson, in which he imported mosquitoes from Italy to London, and exposed his own son, who had never been exposed to other malarial infections, to the bites of these mosquitoes, with the result that this young medical man developed the disease.

Our attention has once more been called to this important subject by a valuable issue of the *London Practitioner*, in which its able editor, Mr. Malcolm Morris, has arranged for a series of articles by well known authorities on the study of malarial infection. The first article is one by Patrick Manson, in which he brings forward the evidence now at our disposal to prove positively the fact that we have already stated, namely, that the mosquito is responsible for every case of malarial fever infecting man. He recognizes the fact that many persons will claim that they have met with cases of malarial infection occurring when the patient was not exposed to mosquito bites, but he goes on to point out that to prove this point such disbelievers in the mosquito theory must show that the patient was never subjected to the bite of a mosquito, and of course this is, in the majority of cases, an impossible thing to do. The well known fact that places considerably above low-lying land or the upper stories of houses confer an immunity against malaria which is not conferred by residence in lower districts does not in the slightest degree disprove the mosquito malarial theory, because the mosquitoes naturally adhere to some extent to the water level, in which water they lay their eggs; and as he also points out, the disappearance of malarial fever during the presence of cold weatner does not prove that the frost has destroyed any "miasm," so-called, but rather that it has prevented the mosquito from being so active and from infecting the individual. Further than this, the assertion that persons are very frequently bitten by mosquitoes and yet do not develop malarial fever is not proof that the theory of mosquito infection is incorrect; for so far as we know at the present time, only mosquitoes belonging to the genus Anopheles have been found to be efficient hosts for the carrying of the parasites from man to man. There are about thirty species of Anopheles in different portions of the world, and all of them, so far as we know, are capable of carrying the infection.

Manson then goes on to tell us the interesting facts that certain definite conditions are necessary for the multiplication of the malarial mosquitoes, namely, a high atmospheric temperature varying from 75° to 104° Fahrenheit; secondly, collections of water, fresh or brackish, containing not over two or three of salt to one of

fresh water, which collections of water must be undisturbed by winds or currents, and which must persist for a time sufficiently long to allow for the evolution of the insect from the egg. If in addition to these possibilities we have a large number of low forms of animal and vegetable life present, we have a condition which is most favorable for the growth of the mosquito and of the parasites. In the presence of very cold weather the larvæ are capable of going into a state of hibernation, so to speak, and so surviving until the return of warm weather. While it is believed in the majority of instances that the mosquito obtains the parasites from the human being, it is not yet proved that it does so in every instance; for it is well known that certain of the lower animals are capable of harboring blood-parasites which in the majority of instances at least are quite different from those harbored by man. Yet it is possible that these animals also may harbor the parasites which affect the human blood.

Manson then discusses the various prophylactic measures which may be introduced to prevent malarial infection. The first of these is of course the suppression of the mosquito. This may be more or less effectively accomplished by many different measures. All pools and ponds should be drained and filled in. Slowly running streams should be so trimmed at their banks as to prevent adjacent pools from harboring the malarial organism, or, to speak more correctly, the larvæ of the mosquito. After the occurrence of floods, a careful drainage of the remaining pools should be instituted; and in the carrying out of engineering projects no pools should be allowed to remain alongside railway embankments.

The second important prophylactic measure is to prevent the infection of man by the bite of a mosquito bearing the parasite. In this connection most valuable experiments have been carried on in Italy within the last few years, of which perhaps the most interesting are those of Celli, Grassi, Fermi, and Tontini, and by the Red Cross Society of Italy. Some of these experiments consisted in taking the employees of two railway lines running through exceedingly malarial country, placing certain of these employees in houses during the night-time, the windows and doors of which were carefully protected by mosquito netting, and allowing the other set of employees to inhabit buildings similarly situated without being provided with such protection. They found that out of twenty-four individuals who were protected, only four contracted malaria, and these were men whose duties took them abroad at night, or that neglected the precautions enjoined upon them; whereas, of the fourteen men of another road who were not protected, twelve got the fever, the two who escaped having apparently acquired immunity. On still another line of twenty-four protected individuals all contracted the fever. These experiments have been repeated again and again by Celli, and by a number of the other investigators that we have named.

Closely in association with these preventive measures to prevent the spread of infection is of course the well known administration of quinine in moderate dose, day after day, for the purpose of preventing the parasites from multiplying in the blood.

The third and last preventive measures which man may institute for his protection is the prevention of injection of the Anopheles by the parasites. So far efforts of investigators have not progressed sufficiently to permit us to carry out very definite action in this line. But it is worthy of note that we can do much toward preventing the multiplication and growth of the mosquito, and we may perhaps be pardoned if we remind our readers that the most important contribution to this subject was made by Celli and Casagrandi in the THERAPEUTIC GAZETTE for October, 1899. It will be remembered that these investigators recorded the results which they had obtained from the employment of various substances which have been found deleterious to the growth of the mosquito larvæ, and one of these substances, it will be remembered, was kerosene, which, in its crude form, poured upon the surface of a pool spread very rapidly, and in very small quantities acts as a powerful destructive agent.

THERAPEUTIC OPTIMISM VERSUS THERAPEUTIC NIHILISM.

For nearly twenty years the writer of this editorial when teaching therapeutics has endeavored to impress upon his pupils the fact that therapeutic optimism when carried to the point of irrational procedure is to be strongly deprecated, and he has also endeavored to combat the ideas which have

been advanced by certain persons who have endeavored to prove the truth of the old maxim that "a physician is a person who administers remedies of which he knows nothing for diseases of which he knows less." There can be no doubt that the careful observer of modern therapeutics is in one sense "between the devil and the deep sea" when he studies these two opposing factions in the medical profession. On the one hand, he sees an array of medical men who seem to think it possible to remove organic lesions and even to replace lost organs by the administration of medicaments, and he reads with grief and shame the reports of cases in which creosote has cured far-advanced pulmonary tuberculosis, chloride of gold remedied chronic contracted kidneys, and iodide of potash cured locomotor ataxia; while all about these fictions and mistaken reports is a circle composed of an immense number of synthetic products made by the chemist, and "boomed" by him for pecuniary returns without being possessed of real therapeutic merit. On the other hand, he sees physicians who are so intent upon the study of pathological and etiological processes that they pay no attention to the proper application of remedies in the treatment of disease, and are so buried in the interests of pathological research in the dead-room that they lose all grasp of the *vis medicatrix naturae* and of the real power of drugs for doing good.

As we have said before, the capable modern physician is one who avoids both of these extremes, and who, while recognizing his limitations in both directions, sets himself to a grave study of the needs of his individual patient and of the remedy which will meet these needs. Our attention is called to this important matter by an article written by Dr. Peabody in the *Medical Record* of March 30, 1901, entitled "Some Fallacies of Therapeutics." While we differ from this well known writer in a number of the points which he makes in his article, there are others which seem to us so worthy of remark that we cannot pass them by. Thus, he states that we are now looking at a time when the ingenuity of the chemist, the cupidity of the manufacturer, and the honest zeal of the physician conspire to multiply therapeutic agents and procedures; and he might have added that there are also physicians not inspired by honest zeal who now and then write paid-for papers lauding to the skies some new drug, although they really have had no adequate experience with it. He then proceeds to call attention to the fact that many of the so-called tonics that are placed upon the market depend more upon the alcohol which they contain than upon any of the medicinal substances said to be in them. This is particularly true of the various bitters which are widely advertised, and which in reality exercise little influence except for the alcohol which they contain, although many of them are sold as non-alcoholic and as remedies by means of which the alcohol habit can be broken up. Another fallacy which he points out, and which undoubtedly is widespread, is the belief that tannic acid when given internally is of no value for the purpose of acting as a hemostatic upon bleeding in remote organs, as, for example, the kidneys or uterus. Whether we believe that tannic acid circulates in the blood as an alkaline tannate or as a gallate, it is certain that it is capable of forming coagulation of albumin only as tannic acid. So, too, he points out that ergot is a practically valueless remedy in hemorrhage from the pulmonary vessels, since it is known to increase the pressure in the pulmonary artery, and, as we have pointed out, these vessels are without vasomotor nerves, and therefore cannot be stimulated to contraction by this drug. Again, as we have often pointed out, the use of lithium with the idea that it will aid in the elimination of uric acid is in the majority of cases useless, because it has a far greater affinity for the acid sodium phosphate of the blood than for the uric acid, and also because there is very grave doubt as to whether uric acid is the cause of the various conditions which are attributed to it; in most cases it being the alloxuric bodies and closely related substances which produce the symptoms.

On the other hand, there are two or three points in Dr. Peabody's paper to which we must take exception. He states very positively that there is practically no proof that bitter substances—as, for example, strychnine—are of any value as appetizers. We do not know what sort of proof he desires in a matter of this kind, but we believe that the vast majority of skilful practitioners have constantly seen the administration of strychnine and other bitters, without the associated use of alcohol, result in an increase in appetite and an increase in

digestive activity; and in the case of strychnine this is not only due to the influence of the bitter tonic upon the mucous membrane of the stomach, but is also due to the increased nervous energy which it is said to give to the digestive nervous organs under its influence.

Another point to which we must take issue is the statement that calomel is a "hepatic sedative," and still more positively do we take issue with the statement that iodide of potassium does not increase the elimination of lead by the kidneys in cases of lead poisoning. We have not infrequently known the urine of such a patient to be examined for lead with negative results for many days. After this iodide of potassium has been administered, and immediately lead has been found in the urine; and while we have no doubt that lead is usually eliminated by the intestines, as he says, we still believe that iodide of potassium is a useful drug in aiding its elimination in both ways, in that it forms doubly soluble iodides which are then readily passed out of the body. We heartily agree with him when he points out that the administration of iodide of potassium for the purpose of causing the removal of hyperplastic connective tissue is without the slightest warrant unless perchance the condition be due to syphilis, in which the drug does good, not by removing any connective tissue already formed, but by modifying the disease and so preventing the further progress of the hyperplastic condition.

Dr. Peabody's article is evidently written from the standpoint of one who having had large experience recognizes the fallacies and strong points of therapeutic procedures, but we think that he has tinctured it unduly with therapeutic pessimism, and as we have said before, some of his statements which seem to doubt the value of well recognized therapeutic procedures are open to criticism. On the other hand, it is well for physicians to know their limitations as well as their possibilities, and Dr. Peabody's article helps them to this end.

SUBSTANCES WHICH INCREASE THE FLOW OF BILE.

Many months ago we called attention to a research carried on by Pfaff and Balch, of Boston, upon the influence of various substances upon the flow of bile in the human being, they having been able to study the secretion of bile in a patient who had been operated upon for disease of the gall-bladder and who had a biliary fistula. It will be remembered that their results were interesting in that they found that practically no drug which is commonly credited with acting as a cholagogue produced any material increase in secretion save ox-gall, and corrosive sublimate, which exercised a feeble influence. At that time we pointed out that it would take many scientific researches to convince the profession that calomel and podophyllin were incapable of increasing the flow of bile into the intestine, whatever the actual effect of these drugs might be upon the secretion of this fluid in experiments. Our attention has once more been called to this matter by a research made by Elliott P. Joslin in the Laboratory of Experimental Pharmacology of the Harvard Medical School, his studies being made upon a married woman fifty-four years of age in the Massachusetts General Hospital in September, 1898, who, as the result of an operation, had a biliary fistula. His research, therefore, is in one sense a sequel to that of his instructor, Dr. Pfaff, and it is of interest not only because of the results which he obtained as to the influence of drugs upon the flow of bile, but also because of the facts which he collated in addition thereto. The research seems to have been carried out with the greatest possible care, and all sources of fallacy excluded. Joslin also found that ox-gall acted as an active cholagogue; the amount of bile solids secreted under its influence being forty-seven per cent greater than any periods before or after its administration, which confirms the work of Pfaff and Balch on the human being, and that of Stadelmann and his pupils on dogs. He also found that the effect of ox-gall on the bowels was not very marked, although in dogs he sometimes succeeded in producing diarrhea by its administration. There is doubt, however, whether the bile can be held responsible for the production of these loose movements.

The value of the presence of bile in the intestine in the digestion of fat was markedly manifest. Thus, the percentage of fat lost in the stools of the woman with biliary fistula varied from fifty-seven to sixty-three per cent; whereas, when the bile was administered by the mouth, it varied only from seventeen to twenty-three per cent.

In other words, its use resulted in an actual diminution in the amount of fat lost in the stools, and the bile increased the digestion of fat nearly fifty per cent. The administration of ox-gall also aided in the digestion of nitrogenous food, less of it being lost in the feces than when the bile was not administered. This is probably due not so much to the influence of the bile upon the digestion of nitrogenous articles as upon the fact that by reason of the better digestion of the fat the albuminous articles of food were better exposed to the digestive juices. We would therefore suggest that when administering cod-liver oil to patients who have difficulty in digesting these substances, the physician also administers ox-gall in pill form, taking the oil and the ox-gall about an hour or an hour and a half after meals, so that it may speedily pass into the intestine.

THE USE OF SUPRARENAL GLAND FOR THE RELIEF OF PAIN.

There can be no doubt that the employment of suprarenal gland for the purpose of causing constriction of congested areas in the nose and throat, and even in the eye, has added very materially to our therapeutic resources, but so far we have not seen many recommendations for its employment in the treatment of painful affections. Of course, it is not to be supposed that the drug has any true power to benumb pain by its influence upon nerve fibers, though it is not to be forgotten in many instances that pain connected with serious pathological processes is due to hyperemia or congestion, which in turn produces pressure upon nerve filaments. We have, therefore, read with interest the report of several cases which has been made by E. A. Peters to the London *Lancet* of March 2, 1901. He records an instance of recurrent cancer of the breast in which various applications, such as permanganate of potassium or orthoform, and similar treatment, had been tried without good result; and even the application of cocaine did not insure a good night's rest. Painting a ten-per-cent solution of suprarenal extract over the growth at nine o'clock at night gave the patient entire relief till six o'clock the next morning. He also reports an instance of stricture of the esophagus, probably due to cancer, which was relieved, after other measures had failed, by sipping slowly a teaspoonful of a ten-per-cent solution of suprarenal before going to bed. Still another, of tuberculosis of the larynx, which had been previously treated with lactic acid, was very greatly relieved by being sprayed with a ten-per-cent solution of suprarenal extract; and a case of periodontitis, in which cocaine, iodine, carbolic acid, and chloroform were all applied with little effect, was given much comfort from the application of a pledget of wool soaked in a ten-per-cent solution of suprarenal extract tucked up between the lip and the gum, being renewed every two to six hours.

SHOCK FOLLOWING ABDOMINAL CONTUSION.

From the study which has been given this subject it might be thought that shock incident to severe abdominal contusion and its diagnostic significance are fairly well understood. It was long held that a severe blow upon the abdomen, particularly in the epigastric region, might cause a degree of shock either immediately or shortly fatal, even in the absence of any demonstrable lesion of the abdominal viscera. Against this belief it was urged that nearly all cases of fatal abdominal contusion showed unmistakable and even wide-spread visceral lesions. Experimentally it was demonstrated that shock could not be produced in animals without such lesions, and it was further shown that a fall of blood-pressure so great as to cause death was induced, not by the sudden commotion of the peritoneal organs or the solar plexus, but rather by jarring of the heart.

As a result of clinical experience it is well known that the symptoms of shock, of hemorrhage, and of peritoneal sepsis, the latter in an aggravated form, are so nearly alike that a differential diagnosis can at times only be made with very great difficulty.

Kustner has shown by pathological examination that many cases of death attributed to shock are in reality the consequence of sepsis.

Seliger *(Prager Med. Wochenschrift,* 1900, No. 29-52) demonstrates the fact that after contusion of the gut, bacteria can travel through its walls, and can rapidly cause death by septic peritonitis, even though the contusion be of such slight degree as to show no microscopic proofs of

its existence on a careful autopsy, the absorption of the bacteria and other toxins being so rapid that there is not sufficient time allowed for gross pathological changes of the peritoneum. Seliger, on the basis of this fact, and as a result of clinical study, concludes that death should be attributed to shock only when aggravated symptoms of this condition are manifest within the first two hours of the traumatism. All cases exhibiting symptoms of shock after this period he attributes to sepsis, thus explaining, and adequately in accordance with modern knowledge, cases of delayed shock of which so much has been written in the older surgeries.

Seliger, moreover, notes that contusions of the abdomen very rarely injure the stomach. The lesion, when found, is in the transverse colon, through the bruised walls of which infection takes place. He also notes a similarity between symptoms of shock of Mors thymica, of ileus, and of coprostasis, occurring in disease of the heart.

This conception of the etiology of the symptoms following abdominal contusions is of great importance to the surgeon. A common teaching, indeed one almost universally accepted, is to the effect that abdominal operation should not be performed when the patient is in a condition of profound shock. The reason for this is obvious. If, however, the symptoms which suggest profound shock are in reality due to a rapid absorption of toxins from the peritoneal cavity, a delay in the hope of better conditions to follow stimulating treatment is absolutely futile. It would seem rather that pronounced symptoms of shock occurring some hours after an injury, or recurring after partial recovery from primary shock, would constitute adequate grounds for immediate celiotomy, with flushing out of the peritoneal contents.

SOME RECENT EXTRAORDINARY THERAPEUTIC SUGGESTIONS.

To one whose line of work or whose inclination prompts him to review from time to time the current medical literature, there comes not only wonder at the wealth and excellence of the material offered, at the insistent activity and progress in all branches of his profession, at the extraordinary variety of ills to which flesh is heir, and at the wonderful efficacy of the medical and mechanical means employed for the relief of these ills, but also at times a sense of pleasure and amusement because of the *naïveté* of the reporter or the originality of the means employed for the cure.

Thus Oeder *(British Medical Journal,* March 9, 1901) narrates in unostentatious but vivid phrases his own sufferings from piles, and states that he obtained relief by so arranging pillows and bolsters that his pelvis was lifted a considerable distance from the bed. The base of the wedge thus formed was placed just beneath the buttocks. Sliding from this position was prevented by resting his head against the headboard of the bed. In this posture he slept, and he notes, with the enthusiasm of the true scientist, that the position was comfortable.

Anderson *(British Medical Journal,* March 9, 1901) describes in some detail the lodgment of a brilliantine bottle in the rectum. The withdrawal of this was attended by considerable difficulty, though forcible traction could readily be exerted by a wire twisted about the bottle's neck. The difficulty was attributed to the concavity of the bottom of the bottle, which acted as a sucker on the mucous membrane. This was relieved by passing the hand into the bowel so that air was allowed to enter. Anderson states that he need not discuss how the bottle got into this position, but notes, as a piece of damning evidence, "there was an absolutely empty vaselin bottle on the dressing table." This latter fact seemed to him conclusive evidence of a hopeless perversion.

Banks *(British Medical Journal,* March 9, 1901) describes a new, and he states an absolutely efficacious, treatment for obstinate pruritus ani. This consists in applying a red-hot iron to the anal skin for an inch and a half around the orifice. The treatment is suggestive of medieval surgery, but Banks mitigates the horrors of the procedure by the almost playful manner in which it is described. Thus he states that the patient is "tucked up" in the lithotomy position; the expression implying comfort, rest, and security. Instead of saying that the skin is burned, he notes that it is "well frizzled."

A zealous German surgeon, appalled at the mortality of peritoneal sepsis, and impressed with the inadequacy of the modern means for drainage, advises the carrying of

tubes through Douglas's cul-de-sac, after which the patient is strapped to a board, and the board is then elevated to an upright position. He even reports excellent results from this procedure.

Another surgeon advises celiotomy and evisceration of the abdomen, after which the patient is placed in a bath of normal saline solution, and the abdominal contents are allowed to float freely in the circumambient liquid.

It is noteworthy that the literature upon spinal anesthetization with which the periodicals were flooded but a few months back is now conspicuous by its absence. Nor does this imply that the method has become so well established and received such wide-spread and general recognition that further study is unnecessary.

Among the most striking treatments recently suggested is that of Leaf for the checking or curing of inoperable cancer of the breast. He has devised with great ingenuity a suction apparatus which is put over the cancerous area involved. This he believes reverses the lymphatic circulation and draws the cancerous juice to the surface. His conception of the pathology of the disease is a refreshing variation from the monotonous repetition which characterizes most standard text-books and journal articles; it is also quite original.

Reports on Therapeutic Progress

QUIET EFFUSION INTO THE KNEE-JOINTS OCCURRING IN WOMEN AND YOUNG GIRLS.

BENNETT *(Lancet,* February 23, 1901) in a lecture at St. George's Hospital called attention to an apparently little-noticed condition of the knee-joint not uncommon in women and young girls, which appears to be a passive effusion into the joint. It occurs but rarely in any other joint than the knee, but on one occasion Bennett saw it in the ankle.

The joints of the opposite sides are usually involved at the same time, but the effusion is generally greater on the right side. There is rarely any pain, and many of those afflicted with the effusion seem unaware of its existence. It is always, however, associated with menstrual irregularity or uterine trouble. It occurs mainly at two periods—at puberty, and when menstruation is about to cease. It may occur at any intermediate period if there is menorrhagia, excessive hemorrhage from the uterus, or great irregularity and difficulty in connection with menstrual affairs.

Although the joint contains a considerable amount of fluid, it is never tense except after superadded injury. The fluid, if the patient is standing, sinks to the lower part of the joint cavity and sometimes leads to a pouch-like overhanging of the synovial membrane at its lower anterior aspect. In the older subjects the aspects of the condition are similar, the main points being the absence of tension and heat and freedom from pain. The patients are usually anemic, but not invariably so.

After a study of several cases, Bennett advises the physician who attends a woman or girl, especially about the ages of eleven to fourteen years, to always inquire into the state of the uterine functions, and always to proceed with the ordinary surgical routine of examining both knees, although the patient may ascribe the effusion to a distinct injury of only one of them. If there be functional irregularities fluid will be found in both knees. In the absence of catamenial irregularity or uterine disorder some other cause must be sought for the condition. Any error in diagnosis can usually be avoided by noticing the character of the swelling, the existence of effusion on both sides, and the coincidence of marked menstrual or uterine trouble.

The primary treatment should be directed to the correction of the faulty functions. There should be moderate exercise and massage for the knees, combined with the healthiest of outdoor lives. Splints of any kind, and an invalid's life, should be rigorously avoided. In the absence of acute symptoms from injury the condition of the knees need lead to no restriction in the exercise.

Recovery, provided the primary cause of the effusion can be cured, invariably follows unless the condition has persisted so long as to produce permanent changes in the joint. If the primary condition proves intractable the effusion will occur continuously or recur at intervals. In cases where the effusion is continuous or is constantly recurring, an increasing weakness of the knees occurs, and in the later stages, when the health becomes broken down by frequent loss of blood or great pain, edema of the legs sooner or later follows, but this

has no specific meaning since it is merely the result of continual exhausting illness.

THE RECENT EPIDEMIC OF TYPHOID FEVER IN SOUTH AFRICA.

An interesting paper with this title has been published by TOOTH in the *British Medical Journal* of March 6, 1901. In it he tells us of his plan of treatment, which was as follows:

One of the earliest difficulties at Bloemfontein was the scarcity of fresh milk. It becomes necessary in such circumstances to fall back upon preserved or condensed milk. There are one or two forms of sterilized milk which are as good and palatable as the fresh article, but they are expensive. The condensed milks of numerous brands are excellent for ordinary use, but it is doubtful whether they possess much nourishing power in illness. The common sweetened form is most unsuitable; patients had as a rule an intense objection to it, and it caused undoubtedly in some cases troublesome vomiting. The other forms of nourishment —for example, arrowroot, beef tea, etc.— were had in plenty. The principle in dieting was to use all forms of nourishment liberally when it could be safely done. Most of the patients were thin and ill-nourished before contracting the disease. Dr. Tooth believes that food may be used much more boldly in enteric fever than is the usual practice. The safety of its employment depends solely on the digestive power of the stomach. If that power is normal, as in many cases it is, meat, for instance, is not likely to reach the ulcerated small intestine in a form more dangerous than a glass of milk is; for milk naturally becomes a mass of curds in the stomach before peptic digestion takes place, and if this latter process is incomplete the undigested curds may be a real source of danger. It seems, therefore, that one should be guided in this matter by the state of the tongue, the evacuations, and the appetite of the patient. If the tongue is moist and fairly clean, if there is no diarrhea —that is, if the evacuations are no more in number than, say, two a day—and fairly consistent, and if there be no tympanites and the patient has a strong craving for food, it is probable that his digestion will be good, and that a liberal diet, including, for instance, finely minced meat, and even thin bread and butter, will not only be safe but beneficial. On the other hand, the dry, brown tongue, frequent curdy stools, and especially tympanites, and a disinclination for food, indicate a condition of stomach that makes careful dieting imperative. Frequent small feeds of milk, peptonized or diluted with barley water, Benger's food, etc., must be used with care, and the stools frequently inspected as a guide to the state in which the food reaches the intestines. But the mechanical effects of undigested food in the small intestine are not the only ones to be feared. Experiment seems to show that the growth of the enteric bacilli is favored, and their virulence enhanced, by the presence in the intestines of other bacteria, such as are encouraged by the presence of undigested food, and themselves tend to produce gastroenteric trouble. So that a slight gastroenteritis may have a grave effect on the course of the attack. This has been justly emphasized by Dr. Horton-Smith in his Goulstonian lectures.

Alcohol was used most sparingly, and only in the severer cases, in which heart failure was feared; not at all in the milder cases. The small rapid pulse was considered the best indication for its use, not high temperature. They rarely gave more than three or four ounces, and never more than six, in the twenty-four hours. The long enforced abstinence of the soldier from all forms of stimulant rendered him rather especially susceptible to its influence as a drug.

Digitalis and strychnine were of the greatest value; in one or two cases gradually increasing doses of the official liquor strychninæ were injected hypodermically, to the extent of thirty minims in the twenty-four hours.

Headache was one of the first symptoms that called for treatment, and five to ten grains of phenacetine generally gave speedy relief, or failing this, a somewhat larger dose of antipyrin. In not a few cases this caused, during the sleep that followed, a profuse perspiration, with perhaps a slight fall in the temperature. Beyond the discomfort of this no ill result followed. In some cases, however, this sweating was so annoying that it became necessary to add 1-100 to 1-150 grain of atropine, which usually stopped it.

Insomnia was one of the most troublesome symptoms, and the cry for hypnotics was a very common one. As a rule, all that was necessary was a small dose of phenacetine, which proved as useful for this purpose as it did for headache. To patients

who were delirious and constantly attempting to get out of bed, hypodermic injections of morphine were given without hesitation, and in considerable doses, such as one-fourth grain repeated several times if necessary.

The care of the mouth and tongue may appear a minor detail. It is not so in the estimation of the patient, and in the severer cases the dry, black, and cracked tongue and lips are more than discomfort—the pain of taking food may positively prejudice the nutrition of the patient. Local treatment may be all that is necessary—mechanical cleansing or the use of mouth-washes; and of these, one containing potassium chlorate, glycerin, and iron perchloride was found to be the most useful. A mixture containing potassium chlorate and sodium bicarbonate given three times a day had a remarkable effect in cleaning and moistening the mouth and tongue, so much so that its use became a matter almost of routine.

Diarrhea is regarded by the author as less a symptom than a complication, and as such requires treatment. In the minds of some it is regarded as an effort of nature to remove deleterious matter, which view is not held by the author, for in all epidemics a considerable if not large percentage of cases have no diarrhea, and these are as a rule favorable cases, whilst among the worst cases diarrhea is most common. This is shown by the fact that out of twenty-nine fatal cases, twenty-one had more or less severe diarrhea. Diarrhea may be due to general enteritis consequent on extension of inflammation from the ulcerated patches to the general mucous surface of the intestine, but it is probably more often caused by an ulceration of the large intestine. There is no doubt that such ulceration is often found in the colon post mortem, very commonly in the region of the cæcum, and in two or three necropsies there was found extensive discrete ulceration of the large intestine, even to the rectum. The treatment of this diarrhea was comparatively simple and undoubtedly of great benefit to the patient. Bismuth carbonate or salicylate and chlorodyne proved the most useful drugs, supplemented, if necessary, by suppositories of one-fourth grain of morphine. In obstinate cases enemas of ten-per-cent boracic acid solution often gave permanent relief, a further hint that the cause of this symptom was in the large intestine.

Tympanites, always a dangerous condition, rarely gave any trouble. It is best treated by boracic injection. A small injection of about four ounces of water containing two grains of quinine and half an ounce of brandy would often cause the patient to pass flatus with great relief.

Hemorrhage occurred in ten cases, on the average of about the eighteenth day. In some it was very profuse, and was repeated two or three times, and was so severe as to cause blanching. It was almost invariably accompanied by a sudden fall of temperature, and generally by a rise in the pulse-rate. In only one was it found after death, not having been suspected during life; with this exception it never proved fatal, and though four of these patients died ultimately, no blood was found in the alimentary tract. Hemorrhage always yielded to, or after, treatment, which consisted of a mixture containing oil of turpentine and tincture of hamamelis, of each half a drachm, and tincture of digitalis three minims. This was given every two hours, or alternately every hour with a drachm of witch-hazel. One physician used witch-hazel alone, a drachm every hour, with apparently equally good results. At the same time morphine suppositories were administered. Under this treatment the stools rapidly ceased to contain bright blood, and in about twelve hours were free from blood altogether.

THE TREATMENT OF TUBERCULOUS PERITONITIS.

Dr. YEO, in *The Lancet* of March 16, 1901, refers to the surgical treatment of tuberculous peritonitis, by which very successful results have been achieved, especially in the early stage and when there is always more or less ascitic fluid in the peritoneal cavity. A practitioner would naturally prefer to dispense with operative procedure if possible, although if he considered it the only means of cure he would certainly recommend it. Dr. Yeo draws attention to a method of treatment which he has tried with success—namely, the application to the abdomen of a liniment containing iodoform or iodine, at the same time administering internally a pill containing iodoform and creosote. He believes that when iodoform is rubbed into the skin of the abdomen in a young person it probably rapidly enters the blood, and is, if regularly applied, continuously eliminated in the secretions, including

the secretions into the serous cavities, and as these do not pass out of the body as the secretion of the kidney does, they must in course of time become richly charged with iodine compounds—at any rate sufficiently so to act as antitoxin to the tubercle toxin or as an antibacterial to the bacilli. This suggestion is a plausible one, and this method of treatment will doubtless receive further and more extended trial. It is a fatal mistake to extol any therapeutic measure that has not passed the ordeal of extended experience, but we shall await with interest the reports of Dr. Burney Yeo and other observers who may adopt the line of treatment suggested by the above theory. It might be found advantageous to use some of those preparations recently introduced in which iodine is combined with a hydrocarbon basis by means of which, it is stated, the drug can be easily applied and is very readily absorbed.

TROPICAL DYSENTERY.

In the *New York Medical Journal* of March 30, 1901, LONG says that in his experience the treatment of dysentery is one of the most difficult problems to deal with, as it requires not only great knowledge of the therapeutical and physiological action of many drugs, but also a practical acquaintance with them and with the technique of administering them per os or per rectum. It requires, also, the knowledge of the different types of the disease. Here comes in the necessity of knowing how to use the microscope and of an acquaintance with the different methods of discovering the bacteria causing the disease. In time of war, and away from civilized countries, our task is often augmented by the physician being thrown on his own resources to deal with all these causes. The question, then, is how to simplify the matter and make our treatment the most valuable possible, using few drugs in a short space of time and under adverse circumstances. It is all right to experiment with new drugs in large city hospitals, but in time of war, or in epidemics, we must cure our patients with routine treatment and as quickly as possible. In the course of his paper the author mentions four drugs that can be obtained in any part of the world, and can be carried with the least possible inconvenience, besides having the sanction of the profession in general.

Eighty per cent, if not more, of the dysentery patients will be cured with one or more of these drugs, while the disease is yet in its infancy. So when we get a case of dysentery or diarrhea a day or two old, the first and right thing is to put the patient at once into bed, giving him an ounce of sulphate of magnesium in half a glass of warm water before breakfast, repeating it the same day if necessary. It is surprising to see how many men will get well soon and report for duty. Calomel, one-sixth, one-quarter, or one-half of a grain, given every hour, until four or six doses have been taken, and followed four hours later with half an ounce of salts, may answer the same purpose, but if there is any doubt as to the cure of the case, we can put the patient on another treatment. We have heard of the miracles as well as the failures of that great drug, ipecacuanha. This drug will often succeed if administered in the following manner: Put the patient to bed, and, while his stomach is empty, administer from fifteen to twenty drops of tincture of opium; then, fifteen minutes later, put an ice-bag on his head, apply a mustard plaster on his stomach, and give a hypodermic injection of morphine, one-quarter of a grain (to give him a chance to sleep), and administer not less than forty grains of ipecacuanha by the mouth; at the same time give instructions to the patient or to the nurse that he is to remain quiet on his back for four hours without moving or taking anything by the mouth, and that, should the saliva increase in the mouth, it is not to be swallowed, but to be spit out. Out of ten patients, it will be found that eight will retain it, and out of the eight who have retained the medicine, only one or two will need a second dose. So, from sixty to seventy per cent will be cured by one administration, from ten to twenty per cent will be cured by a second dose, and twenty per cent will require some other kind of treatment.

This brings us to another class of medicine, namely, bismuth subnitrate. By this is meant that preparation of bismuth only. The other preparations of bismuth have their own place in medicine, but it is not here. The bismuth subnitrate should be given in very large doses, if we expect good results. Forty or sixty grains every three or four hours is a very moderate dose, and if bismuth alone is not enough to check the trouble, then comes the mixed treatment, when the fourth drug steps in—that is, the

great pain-killer, the comfort as well as the pacifier of so many sufferers—opium. This medicine should never be omitted from the list in treating diarrhea or dysenteries, whether acute or chronic. There are several ways of administering it, as with camphor, ipecacuanha, as in Dover's powder, or with Squibb's mixture, etc. The author advocates the administration of forty grains of bismuth subnitrate and five grains of Dover's powder, well mixed, every three or four hours, as the case may indicate. Still another and easy way of administering ipecacuanha—that is, in one-grain or half-grain doses every hour, for two or three days—often gives good results. The first method is considered preferable. It is of no use going astray and trying other methods, such as benzonaphthol, betanaphthol, salicylate of bismuth, bismuth subgallate, etc. All these medicines are good antiseptics, but most of them break up in the animal economy into different compounds and lose their antiseptic value. They have received a good trial, and have been proved inferior to our every-day medicines—bismuth, Dover's powder, and ipecacuanha. Sometimes, if the stomach gets out of order, bicarbonate of sodium in ten-grain doses, combined with bismuth and Dover's powder, acts like magic.

Here the author opens another chapter of treatment which he believes has not yet gained either the confidence or the sanction of the profession at large. There is a great struggle between the two schools, one advocating the internal administration, the other the topical application, of the drugs, either by injections, suppositories, or enemata. The use of enemata has been given a fair trial, and in some cases it is a life-saving treatment which should not be neglected. One now and then comes across cases in which all internal medicines will prove a failure, but which enemata will cure. Here, again, there is some diversity of opinion as to cold or hot water enemata. In a few cases cold water may be the best; but the hot is considered preferable for the following reasons: First, it is a better solvent than cold water; secondly, it is cleansing, clearing the bowels from slime and mucus; thirdly, it is aseptic; fourthly, it is absorbed by the tissues quickly; and fifthly, it is well borne by many. As to what medicines can be used with the enemata, the author prefers, of all the antiseptics and germicides, silver nitrate, twenty grains to the pint, or quinine, for amebic cases, but reminds us of the necessity to clean the bowels of the patient with a soap-suds enema before administering the medicated enema. The knee-chest or dorsal position can be tried. As to instruments for giving the enema, never use a hard-rubber catheter or the bulb syringe, as, when the ulcers are in the rectal region, alarming results may follow. A rubber bag or fountain syringe with a soft-rubber rectal tube attached to it is all that is necessary for the operation. In this connection two more drugs are mentioned that have of late come into extensive use. One is the tincture of the chloride of iron, one drachm to the pint of hot water, mostly used by the English profession in India; and the second, peroxide of hydrogen. In this country the tincture of iron, if tried, will be found to give as good results as nitrate of silver, but peroxide has few advocates. Normal salt solution enemata, laudanum, and starch-water enemata are also good and beneficial.

TREATMENT BY DRUGS OF PARALYSIS AGITANS.

The *Medical Chronicle* for February, 1901, contains an article by WILLIAMSON on this topic. He has tried carefully a very large number of drugs which have been recommended by various writers, and very many which have not been recommended, and often pushing them until toxic symptoms have appeared, but the majority have not produced the slightest benefit. Amongst the drugs found useless, mention is made of arsenic, quinine, potassium iodide and bromide, strychnine, Calabar bean, cocaine, cannabis indica, caffeine, nitroglycerin, atropine, nitrate of silver, tannate of cannabin, butyl-chloral-hydrate, piscidia, chloretone, heroin, dionin, suprarenal extract, and many others. The drugs which have been found to be of decided value in the palliative treatment of paralysis agitans are hyoscine hydrobromate, duboisine sulphate, and hyoscyamine.

Hyoscine hydrobromate is the drug which he has found to be the most useful. It was recommended some years ago by Professor Erb, of Heidelberg, and has been also recommended by many Continental physicians; but in some of the best recent accounts of paralysis agitans in English medical literature the use of hyoscine is not

mentioned. Moreover, a number of writers have recorded that they have not found the drug to be of any service whatsoever. Professor Erb has recommended the drug to be used hypodermically, and thinks its value, when given by mouth, is very much inferior; also by other Continental physicians it is recommended chiefly hypodermically. The English patients suffering from paralysis agitans who have come under the author's care always objected to treatment by any drug given hypodermically day by day; and in such a chronic disease it does appear to be very desirable to give the medicine by mouth, if possible, for many reasons. The puncture of the skin with the hypodermic needle, once or twice daily for months or even years, appears to be very undesirable on account of the risk of septic infection; also female patients usually object to the pain produced by the prick of the needle; and then there is always a greater risk of an overdose of the drug, if the hypodermic injections be left in the hands of the patient's friends. The author therefore commenced the treatment of paralysis agitans some years ago with hyoscine given by the mouth. He gave it in the manner and dose recommended, 1-200 to 1-150 of a grain in a pill, three and afterwards four times a day, for long periods, without any effect. He increased the dose to 1-100 of a grain in pill form, but was never able to detect the slightest benefit. Whitla and others have had the same experience. The author gave up the drug entirely, and concluded that it was useless.

At a later date he again gave it a trial and prescribed it in chloroform water, thinking that it would be perhaps absorbed more rapidly in this form, and that possibly, when given in the form of a pill, the absorption might be too slow to produce any marked effects. Whatever may be the reason of the failure of the drug in the first trial, he was pleased to find a slight but distinct effect when given in doses of 1-96 of a grain in chloroform water. As many writers (including Professor Erb) have recommended that the drug should only be given in very small doses, it was a long time before Dr. Williamson ventured to give it in larger doses than 1-96 of a grain. But in course of time he increased the dose to 1-75 of a grain without any bad effects, and found that this dose was distinctly more efficacious than 1-96 of a grain.

The author states that one of his patients who suffers from paralysis agitans, with all the characteristic symptoms, has taken hyoscine for four years with short intermissions. The dose has only been small, sometimes 1-96, sometimes 1-75, of a grain twice (occasionally three times) a day in two drachms of chloroform water. No bad symptoms have ever been noted. Though the tremor is not arrested by this dose, it is undoubtedly diminished; and the drug also diminishes the general restlessness and constant desire to change position, which is such a troublesome symptom of the disease. Whenever the hyoscine has been discontinued for a few days the tremor and restlessness have always been worse, and it has soon been necessary to return to the drug. The action of the hyoscine in this case has always been most powerful when first commenced; after a time its effect has diminished; but if it has been discontinued for a few days, the effect has been well marked when the drug has been commenced again.

The author has found in his experience that hyoscine not only arrested tremor, but it checked troublesome restlessness and desire to change position; also it caused the unpleasant sensation of heat and the flushing of the face to disappear. When the tremor was most marked there was usually great restlessness and flushing of the face, and a sensation of heat. All these symptoms were diminished or arrested by the hyoscine. The dose required to produce this decided effect was 1-64 of a grain, but this quantity often produced dryness of the throat, which had to be relieved by a little lemon and water. A smaller dose, 1-77 of a grain, diminished the tremor and restlessness, etc., very much, but did not cause these symptoms to disappear entirely; this dose, however, did not cause any dryness of the throat.

A word of caution must be said with respect to the dose and mode of administration, for hyoscine is a very powerful drug. For the reasons already mentioned, the author believes it is best to give the drug by mouth in paralysis agitans. At first the dose should not be more than 1-150 of a grain. This may be increased up to 1-100 of a grain. If no toxic symptoms appear, such as marked dryness of the throat and dilated pupils, the dose may be cautiously increased. Some patients cannot take 1-100 of a grain without toxic symptoms appearing; but in paralysis agitans the dose may often be increased to 1-75, 1-55, or even 1-48 of a grain without bad effects, except dryness of

the throat. But such large doses should only be given when the patient is in hospital, or can be very carefully and frequently watched. In one case the author found 1-64 of a grain by mouth checked the tremor completely; but frequently it was necessary to diminish the dose to 1-77 of a grain for a day or two, on account of the dryness of the throat produced by the former dose. The doses which were most useful in this case were therefore 1-77 or 1-64 of a grain. But the exact dose ought to be determined for each case. It has been the invariable rule with the author to use hyoscine hydrobromate, and he believes that it is the best. It is important to always use the same preparation of hyoscine, as probably the strengths of different preparations vary somewhat. It is best to give the hyoscine well diluted in chloroform water. A prescription which is useful is one-eighth of a grain of hyoscine hydrobromate in six ounces of chloroform water. At first two teaspoonfuls of this may be given, then three, four, or five teaspoonfuls. If necessary, the dose may be increased to six teaspoonfuls (1-64 of a grain) providing toxic symptoms are not produced. The hyoscine is best given in the morning, just after breakfast, and again in the evening, just before going to bed, if the patient is troubled with restlessness and sleeplessness during the night.

Duboisine sulphate was strongly recommended, hypodermically, by Professor Mendel a few years ago. Dr. Williamson has given it a fair trial by mouth in two cases. In one case it had little effect; but in the other case it decidedly diminished the tremor and restlessness, when given by mouth in doses of 1-64 of a grain in water. He has tried it in various doses up to 1-48 of a grain. Its action is similar to hyoscine, but it has not been found so useful as the latter drug. Usually it has not been possible to give more than 1-64 of a grain without producing toxic symptoms. From records in literature it appears that in some cases hyoscine is most useful, in others duboisine; so that both drugs are deserving of trial in every case.

Hyoscyamine sulphate has been tried, beginning with a dose of 1-96 of a grain and increasing gradually up to 1-55. It did not appear to produce dryness of the throat so readily as hyoscine. It diminished the tremor and restlessness, but not so decidedly as hyoscine.

Morphine, opium, and codeine have been found of service by many writers; but in the cases in which these drugs have been tried, if the dose has been small no effect has been produced; if medium or fairly large doses have been given, the usual bad effects of these drugs (constipation, digestive troubles, etc.) have been observed without noticing any relief of the symptoms; and it has not been possible to further increase the dose on account of the patient's objections to the bad effects.

In very advanced cases Heimann, Oppenheim, and others speak favorably of the use of morphine hypodermically for relieving the tremor and subjective symptoms.

Small doses of tincture of veratrum viride have been recommended in Germany; and Oppenheim recommends also tincture of gelsemium. Both have been given a short trial in small doses, but no good result observed.

Sleeplessness is often a troublesome symptom in paralysis agitans at an advanced stage. When the patient has a sleepless night next day the tremor and subjective symptoms are much worse. Hence it is very important to secure a good night's rest as often as possible. There is one little point of practical value—the bed should not be too soft. A patient who suffers from paralysis agitans at an advanced stage has great difficulty in turning over in bed when the position is not quite comfortable, and this difficulty is increased if the bed be too soft. If there is difficulty in getting to sleep, on going to bed a little whiskey and water may be taken, or sulphonal or trional may be given an hour or two before retiring. If the sleeplessness is in the early morning, the sulphonal may be taken immediately before going to bed. A dose of hyoscine is of service in diminishing the tremor and restlessness, and so promoting sleep. Hence as already mentioned hyoscine is often best given twice a day, in the morning and just before going to bed. When the patient is much troubled with sleeplessness in the early morning, a dose of hyoscine taken at this time will often be of service by diminishing the restlessness and tremor and so causing the patient to fall asleep again, or, at least, relieving the subjective symptoms. The exact dose of hyoscine required must be determined by commencing with a small amount and cautiously increasing. The author has often given 1-75 or 1-64 of a grain by mouth in such cases, with much advantage.

Of course, if there is the possibility of a dose being required during the night, it is best to have the exact quantity of the medicine poured into a glass before going to bed and placed by the bedside—to be taken in the night if required.

The bedclothing should not be too warm and heavy.

For the troublesome pains in the limbs, antipyrin or phenacetine is sometimes of service.

QUININE AS AN OXYTOCIC.

According to the *Bulletin of the Cleveland General Hospital* for October, 1901, Professor McGee believes that quinine possesses evident power as an oxytocic, although some authorities question whether this phase of its action exists to any great degree. Giving it in an almost routine manner for years in cases of uterine inertia, he feels confident that it is worthy of trial when such a condition exists. It is doubtless true that it will not initiate labor pains when taken by a pregnant woman, but in the second stage of labor, when an obstacle to delivery is present, and the uterine contractions are deficient in force, it will frequently increase their power, and so hasten delivery. Its effects are without doubt due to a general tonic action and increase of nervous energy, rather than to any such specific power as ergot possesses, but it is devoid of the dangers of the latter, and so is a preferable agent to employ. It can be given with a feeling of safety and generally with satisfaction. The dose of ten grains usually recommended is quite large, and will often occasion vomiting, and five grains can generally be given every twenty minutes or so until about twenty grains have been taken. It is best to give it in solution, as it is more promptly absorbed, and when added to a small quantity of brandy or whiskey, diluted with hot water and well sweetened, is rarely refused. Sugar, as we know, is another agent to which oxytocic action has been attributed, but it probably acts as a rapidly available food, so producing force, and aiding in cases of exhaustion. While the solution of quinine is rather bitter, the patient will generally take it when assured it will benefit her, and by its aid one will often shorten an otherwise lengthy labor without detriment to the child or mother.

The claim has been made by eminent authority that quinine tends to produce postpartum hemorrhage. This, the author states, is contrary to his experience, as he has never seen a case which, in his opinion, could be attributed to it, and, on the contrary, has rather regarded it as a safeguard against such an occurrence. It is indicated most frequently in the inertia of multiparæ, with flabby muscles and a general atonic condition; and hence, with a fairly dilated os and pains deficient in power, quinine is quite effective in increasing their energy and efficiency, and many of this class of cases will readily respond to its action. Idiosyncrasy, middle-ear disease, or cerebral involvement would contraindicate its use, and tinnitus aurium is usually the only unpleasant effect. Should it fail, we still have the forceps in reserve, and as these cases are often lingering and exhausting, it is safer to know that the patient has received fifteen or twenty grains of the drug, for its general tonic effect, as well, perhaps, as for its prophylactic power in diminishing the danger of septic infection. In incomplete abortion, too, its use will frequently be followed by the expulsion of the uterine contents; the general opinion is that ergot under such conditions should not be given, but the author can see no objection to the use of quinine, while after abortion its administration may aid involution, given alone or combined with the usual agents, as ergot, strychnine, or hydrastis.

THE LOCAL USE OF THE NORMAL SALINE SOLUTION.

F. C. Taylor, in the *Bulletin of the Cleveland General Hospital* for October, 1900, reminds us that the value of normal saline solution (six-tenths of one per cent solution of sodium chloride, or roughly estimated, a teaspoonful to the pint) as a therapeutic agent, so far as its internal use is concerned, is too well established to admit of argument. In shock, collapse, either simple or that resulting from excessive hemorrhage, toxemia, etc., it has been and is being used with signal success. In laparotomy every surgeon has noted the marked improvement in rhythm and volume of the pulse of his patient after he has filled the abdominal cavity with a saline solution. The practical value of intra-abdominal, intravenous, intrarectal and subcutaneous administration of saline solution has been es-

tablished beyond question, and by observers of ability and unimpeachable integrity.

The local use of normal saline solution, however, has received but scant mention in literature; it is to this use that attention is called by the author.

Normal saline solution is said to correspond to the fluid portion of the blood—to be the ordinary pabulum of the corpuscles. Investigators have noted after its use the marked increase in the number of colored disks, as well as an increase in numbers and in activity of the leucocytes.

The saline solution, therefore, not only fills the collapsed vessels, in cases of excessive hemorrhage, for instance, and thereby relieves the overstrained heart, but it also stimulates the blood-corpuscles and indirectly the nerve centers.

Assuming that normal saline internally administered stimulates and tones up the corpuscles, is it not reasonable to assume that it may be of value as a local application in many cases where chemical antiseptics are used to-day?

Bichloride of mercury, carbolic acid, formaldehyde, and boric acid, are beyond question antiseptics and germicides, and when applied to an ulcerating or granulating surface they are of undoubted value in destroying the microorganisms present; but while they are destroying the microorganisms they are also destroying the delicate granulations.

Nature has provided an army of defense against septic invasion—the phagocytic power of the leucocytes is admitted by all physiologists. Why not then assist nature—feed and stimulate these fighters and thereby repulse the septic invasion?

The author does not wish to be understood as advocating the entire abolition of chemical antiseptics, but he does maintain that in many cases a more rapid and satisfactory result may be attained by assisting nature—by supplying the white corpuscles with an overabundance of food, without attempting to destroy the infection by "chemical antiseptics."

McBurney (International Text-book of Surgery) says: "It (normal saline) is the only chemical preparation that does not produce irritation when brought into contact with wound surfaces. After its use aseptic wounds may be closed, for the tissues will have suffered no more injury than is caused by the ordinary operative manipulations, and septic tissues, already weakened by bacterial poisons, will be more capable of resisting pathogenic organisms than if exposed to caustic applications."

The author's experience in private practice and in the wards of the hospital, where he has had abundant opportunity of testing the relative merits of the normal saline solution and the various antiseptics, has convinced him that there is a wide field for the local employment of this valuable therapeutic agent. He has seen many times an unhealthy, necrotic surface, after twenty-four hours' saturation in saline solution, change absolutely, the purulent discharge diminish, the unhealthy granulations assume the red hue of health, and beginning cicatrization be most evident. The tissues rapidly absorb saline solution, hence greater care is required than in the employment of corrosive sublimate or similar chemicals in solution.

There is no danger of using too much, but rather the danger of using too little. The wound should be dressed in the ordinary manner—sterilized gauze next to the surface, and over it a thick layer of cotton; this should be thoroughly saturated with saline, and over all placed an impervious covering—oiled silk, rubber sheeting, or something of that nature.

If the denuded surface is large the absorption will be exceedingly rapid, and in an hour or two the dressing will be found to be practically dry. Hence the solution should be added frequently and in large amounts. The protection can be easily opened and fresh saline poured on without disturbing either the patient, the dressing, or the wound's surface. It is probably needless to say that the solutions should be sterilized. In itself saline has absolutely no germicidal power—it acts indirectly by increasing the resisting power of the tissues.

The application of normal saline solution to burned surfaces has been advocated, and the author's experience satisfies him that in this employment it is the agent *par excellence*. The relief from pain is almost instantaneous, the convalescence is rapid, and the resulting cicatrix is slight compared to the amount of damage to the tissues and to that found after the employment of any other therapeutic agent with which he is familiar.

THE TREATMENT OF EPILEPSY WITH OPIUM AND BROMIDE.

The essential nature and the intimate pathology of epilepsy are as yet not understood, and we are still without a specific or invariably successful method of treatment. In fact, all of the remedial measures at our command can be said to be only palliative, as even when the attacks have remained in abeyance for long periods of time, definite assurances of cure cannot be given. In all cases distinct good can be accomplished by a careful regulation of the diet and the mode of life, and among drugs there is none, intelligently used, that seem so efficient as the bromides. The latter, however, by no means always bring about the desired result, and even when they lessen the number and the severity of the attacks, their use is not wholly unattended with unpleasant effects, and their influence may after a time be lost. Inasmuch as physiological as well as pathological activity, like all other forms of force, is expended along lines of least resistance, one is at times justified in taking radical steps for the purpose of breaking up what may be designated as the convulsive habit.

Within recent years a combination of opium and bromide, with various accessories, has been proposed in the treatment of epilepsy, but there has been some want of agreement as to the results obtained therewith. Meyer and Wickel report a small series of cases thus treated, in which the severity of the attacks was mitigated and both the physical and mental condition was improved. The underlying principle of the plan pursued consists in a gradual increase in the dose of opium, but not beyond fourteen grains daily; in careful regulation of the diet; and in applications of cold water. Whether the patient has previously taken bromide or not, the treatment is begun with doses of three-fourths grain of powdered opium thrice daily. This dose is increased to one-sixth grain on the third day, an additional one-sixth grain on the fifth, and so on until, on the fifty-first day, the daily dose will be fourteen grains. This maximum dose is given for but one day, being replaced on the following days by a mixture of bromides—potassium bromide, 15 grains; ammonium bromide and sodium bromide, each 7½ grains—in doses of 30 grains thrice daily for two days; then 35 grains for two days, 40 grains for two days, and thereafter 45 grains thrice daily.

From the beginning a dilute solution of hydrochloric acid—1.5 to 200—is given thrice daily after meals in doses of a teaspoonful. In the diet, alcohol, coffee, tea, bouillon, sausage, acids, and strongly spiced articles, mustard, pepper, vinegar, and all spices are forbidden, and salt is restricted to a minimum. Meat is permitted in small amount and the patient is encouraged to take demulcent soups, eggs, rice, etc., and if constipation be present, fresh vegetables. The diet must be regulated somewhat by the surroundings and the circumstances of the patient. During the first period of bromide administration, cocoa, eggs, and scraped meat may be added.

From the first day of the period of opium administration a cool bath is taken in the evening before eating, at first at a temperature of 86° for ten minutes, and reducing the temperature 2.25°, and the duration of the bath one minute, daily until a temperature of 70° and a duration of three minutes are reached. The baths are thus continued for a week; then, with the same temperature, but for four minutes, for another week; next at the same temperature for five or six minutes. In the first week of the period of bromide administration the bathing is intermitted, then being resumed at 86° for ten minutes and following the course already laid down. Every third day the patient is weighed, and pulse, temperature, and respiration carefully observed. The bowels must be kept regular by means of enemata, infusions, abdominal massage, but not purgatives; besides, note is taken of the number of attacks and of other details of the patient's condition.

The most important contraindications for the treatment are serious impairment of the nutrition and weakness of the heart. The number of attacks is not diminished during the period of opium administration; it may even be increased. Subsequently, however, the attacks become less frequent, and during the period of bromide administration they cease altogether. The mental state also exhibits distinct improvement. The treatment is to be continued by the administration of large doses of bromide—if possible, two drachms daily—for at least a year, with a tablespoonful of the solution of hydrochloric acid (1.5 to 200) thrice daily, and the same diet as was used during the period of opium administration, avoiding especially alcohol, tea, coffee, spices, and meat beyond moderation. A quiet mode of

life and avoidance of physical and mental excess, especially excitement, are further conducive to the success of the treatment.—*Journal of the American Medical Association*, March 9, 1901.

THE CONTROL OF COUGH IN TUBERCULOSIS.

This important subject is written about by LALESQUE in the *Journal de Médecine de Bordeaux* of March 10, 1901. He believes that it is extremely important that the patient should to a certain extent control the cough by voluntary means rather than by the continued administration of cough sedatives, and suggests that the patient should make it a rule that there should be no cough without expectoration, because often the cough is a reflex phenomenon due to irritation, or, in other words, is a form of brusque cough which when frequently repeated exhausts the patient without any result. In some instances, of course, it is exceedingly difficult for the patient to voluntarily control the cough, and when the lungs are filled with secretion and broken-down material it is manifestly necessary that a certain amount of cough should occur in each twenty-four hours in order that septic absorption from retained sputum shall not take place. Lalesque points out that it is rather curious how patients can be trained in regard to their cough and expectoration; that in some instances by a process of training cough can almost entirely be put aside, and the patient become so skilful in bringing up sputum that not infrequently expectoration and a clearing of the lungs is accomplished without prolonged exhausting cough. As we have already pointed out there are some cases in which it is impossible for the patient to control the cough, but there are others in which the cough habit seems to be to a certain extent established, and for such a certain amount of training is certainly advisable.

THE TREATMENT OF ACUTE ARTICULAR RHEUMATISM BY PUNCTURE OF THE JOINT AND INJECTION OF CARBOLIC ACID.

In a report in *La Semaine Médicale* of February 13, 1901, ZAGATO is said to have recently employed injections into the joints in the treatment of acute articular rheumatism. This Italian physician, having tried without success the hypodermic injection of opiates and salicylate medication, proceeded to extract the liquid which had accumulated in the joint by tapping in order to relieve the patient of pain which was in part due to the distention of the joint. This was, of course, done under the most careful antiseptic precautions. After this, by means of a long hypodermic needle he injected a two-per-cent solution of carbolic acid in water —the quantity of solution being one cubic centimeter (15 minims). After the withdrawal of the needle, he stated that the patient was able to move the joint without suffering much pain. He also used massage following this injection, and enveloped the part with hot compresses wet with a solution of salicylic acid. He states that under treatment carried out in this way the patient was almost entirely relieved of pain, and that in the space of three or four days all the morbid symptoms in the right knee-joint disappeared. A short time afterwards the left knee became affected, and the same treatment was carried out with equally good results. The liquid ought to be withdrawn from the joint by means of a very fine syringe, and in his experience was clear, absolutely inodorous, and the color of olive oil.

THE EMPLOYMENT OF HEROIN IN THE TREATMENT OF PAIN.

This comparatively new derivative of morphine, which has been used so largely for the control of cough, has also been employed to a certain extent for the relief of pain; and it is claimed by ARTAUD in *Lyon Médical* of March 10, 1901, that its use in many cases renders the same service as does morphine, its influence often lasting for as long a period of time, and possessing the advantage that it does not disturb the digestive tract. In one instance in which the patient was suffering from severe acute left sciatica, he found that its hypodermic use resulted in the rapid diminution of pain after the first injection; after the second it was still more diminished; and after the third it entirely disappeared. The doses which he gave amounted to about 20 minims of a one-per-cent solution of heroin hydrochloride, and the first evidences of its good effects were produced within five or six minutes after the injection was given.

THE TREATMENT OF HEMOGLOBINURIC FEVER.

McELROY states in an article in the *Memphis Medical Monthly* for March, 1901, that in his view the procedure which seems to offer the best results is to withhold quinine. Seldom is any antiperiodic indicated. When diarrhea is absent, which is usually the case, give calomel in ten-grain doses at intervals of three hours for three doses. This, it is believed, relieves the symptoms due to polycholia better than anything else. If the calomel does not produce bilious, tarry stools in the proper time, assist its action with hyposulphite of sodium. If the nervous symptoms are distressing and the vomiting harassing, morphine hypodermically affords the best relief, but many regard it as absolutely contraindicated in these cases. Stimulate the heart when weak, which is usually a condition present at some period of the attack. Plenty of water, with the citrate of potash and sodium bicarbonate as a diuretic, should be given. Stimulating diuretics should be withheld. Promote the action of the skin. With the first appearance of oliguria, the safest procedure is to apply dry cups to the loins, follow with poultices, and administer normal salt solution hypodermically; this is preferable to intravenous injections. The author has for some time used this measure, for which he claims no originality, with better results than any other.

In the *British Medical Journal* of September 8, 1900, an abstract of Dr. Paul Gouzein's paper read before the International Medical Congress recently at Paris is given which the author quotes as worthy of trial. Dr. Gouzein's rule of practice is as follows:

If at the end of twenty-four hours of hemoglobinuria the urine shows no tendency to clear, and the temperature is not above 39° C. (102⅘° F.), a first injection of from 100 to 300 grammes of artificial serum (7 grammes of sea salt to 1000 of water) should be given in the thigh. This is given with the idea of stimulating and maintaining the vital energy during the time necessary for corpuscular repair and the restoration of functional equilibrium. Each injection should last from five to fifteen minutes. Ordinarily it is well borne. In cases of moderate severity, Dr. Gouzein also uses with advantage small enemata of the serum of 200 grammes each in the twenty-four hours. He has also employed with much success an infusion of Ahouandeme, the name given by the natives of Dahomey to the *Cassia Occidentalis* L. Whether the preparation acts solely by virtue of its diuretic, diaphoretic, and cholagogue properties, or whether it has a specific action on the pathogenic agent, is at present unknown. In some cases it acts almost at once, the urine clearing and being increased in quantity, with copious stools followed by rapid convalescence. The recognition of the good effects of the plant has led to its widespread cultivation in the colony. From January, 1897, to the end of March, 1900, Dr. Gouzein has treated fifty-three cases of bilious hemoglobinuric fever without a single death.

THE ACTION OF OPIUM ON THE STOMACH.

In *La Semaine Médicale* of February 20, 1901, LEPINE, professor of clinical medicine of the Faculty of Medicine at Lyons, contributes a short article upon this subject. He begins by pointing out that for many years it has been the custom to administer one of the opium preparations in the treatment of the pain of gastralgia, but that more recently it has been thought that the administration of this drug augments the acidity of the gastric juice. He then goes on to quote a considerable number of authors who, he believes, support this view, and states that when the gastric pain is due to a hypersecretion of hydrochloric acid, opium is not the remedy of choice, but that atropine, or one of the drugs closely associated with it, is the drug which should be employed for the relief of the pain. It will be remembered that morphine is largely eliminated from the gastric mucous membrane, and it is perhaps possible that the increased activity of this membrane in the process of elimination is associated with a distinct increase in the secretion of gastric juice.

HEMATOPORPHYRINURIA FOLLOWING CHLOROFORMIZATION.

According to *La Semaine Médicale* of February 20, 1901, NICOLAYSEN has recently reported in one of the Scandinavian medical journals the case of a young woman of twenty-nine years who after an operation, during which she took forty grammes of chloroform, developed hema-

toporphyrinuria. The urine did not contain either sugar or albumin, but there were some cylindroids. The hematoporphyrinuria disappeared in about a week; but for about three months after the operation there was marked urobilinuria. The nature of these two substances was determined by spectroscopic examination. Nicolaysen supposes that the condition resulted from the active breaking down of blood coloring matter in the liver, which in turn was largely dependent probably upon deficient oxidation, and this was again dependent upon diminution in the activity of the heart.

THE TREATMENT OF DELIRIUM TREMENS BY THE INTRAVENOUS INFUSION OF SALINE SOLUTION.

WARBASSE contributes to the *Medical News* of March 2, 1901, the following interesting remarks:

The disease under consideration is characterized by autointoxication. A chronic degeneration of the glandular structures of the body results from the prolonged use of alcohol. Particularly when the whole organism suffers the shock of traumatic injury, the secreting and excreting structures, by virtue of these degenerative processes, become disturbed in their functional equilibrium and a toxemia results. The identity of the peculiar toxins of delirium tremens has not been determined. It must be assumed, however, that these toxins are in part waste materials which are dependent upon the emunctory organs for their elimination, and in part the so-called internal secretions of organs, which in the normally balanced organism play a physiological rôle. Delirium is characterized by the action upon the nervous system of these products, which, by virtue of the pathological conditions present, fail to become eliminated, absorbed, or neutralized.

In the majority of these cases the natural resources of the system are sufficient to overcome the toxemia, and the glandular equilibrium becomes restored. In a certain class of cases the intoxication is fatal, even in the presence of kidneys which are able to excrete an adequate amount of urea.

The great value of intravenous salt infusion in cases in which the blood contains a profoundly poisonous amount of toxic substance has led the author to apply this method of diluting and hastening the elimination of the poison in the extreme intoxication of delirium tremens. This opportunity is taken to place on record the following experience, occurring in the service of Dr. Pilcher in the Methodist Episcopal Hospital in Brooklyn: The patient was a man, thirty years of age, a habitual drinker of whiskey. The urine showed the evidences of but a very moderate degree of urea-eliminating derangement. He suffered a fall from a wagon, sustaining a contusion of the right side of the chest and abdomen and a slight wound of the scalp, with transient cerebral contusion symptoms. He regained full consciousness in about an hour. The first symptoms of tremor appeared a few hours after the injury. This continued in a slight degree until the third day, when the temperature rapidly rose to 104.2° F., and the patient became profoundly overwhelmed with the disturbances associated with a violent attack of delirium tremens. The pulse became rapid and weak, and on the fourth day the temperature was 105° F. Until this time sedatives and the routine treatment for delirium tremens had been employed, together with alcohol sponging for the fever. On the fifth day his general condition was still worse. The heart was weak and rapid. The skin was cyanotic and bathed in cold perspiration. The delirium was of the low muttering type, and the general picture was that of a case profoundly overwhelmed with some virulent systemic poison, which promised to terminate fatally within thirty-six hours. At this stage an infusion of 1200 cubic centimeters (40 ounces) of saline solution at a temperature of 116° F. was introduced into the median cephalic vein. The change that came over the patient was a most striking one. The circulation rapidly improved, the delirium subsided, and the patient regained consciousness, all within a few hours. On the day following the temperature had subsided to 99.6° F., and the complete recovery was rapid and uneventful. The changes in this case were so rapid and striking that it seemed like a resuscitation.

The infusion in such cases as this accomplishes the following things: It increases the amount of the circulating medium in which the toxic materials are dissolved, thereby diluting the poison and bathing the nerve centers with a more attenuated solution of the same. The amount of circulating fluid is increased above the normal, so that the excretion of fluids through all the fluid-excreting channels is increased, there-

by carrying off in solution much of the contained toxins. The action of the heart is improved by the filling of the relaxed vessels. These suffice to restore the physiological equilibrium and turn the balance in the favor of recovery. Thus we may add indefinitely to the uses of this most valuable therapeutic measure.

INOCULATION AGAINST ENTERIC FEVER

The general results of a statistical comparison between the inoculated and uninoculated British soldiers serving in India, so far as an experimental trial has been made of Professor Wright's method of inoculating against enteric fever in that country, are stated to have been distinctly in favor of the inoculated. The results are, at any rate, sufficiently favorable to indicate that a further and more extended trial of this system of treatment should be made. An interesting communication from Professor Wright published in *The Lancet* of February 9, p. 399, furnished the results of an officially compiled statistical statement dealing with the effects of antityphoid inoculations in the case of one corps—the 15th Hussars. From this statement it appears that the incidence of enteric fever in the inoculated is represented as 0.55 per cent and the mortality 0.27 per cent, while the incidence in the uninoculated is 6.14 per cent and the death-rate 3.35 per cent. Although these figures are drawn from a comparatively limited number, it will be seen that so far as they go they are very favorable to inoculation.

Inoculation against enteric fever has also been largely resorted to among the troops serving in the South African war, and the publication of the returns showing the results is anxiously awaited, and should soon, we imagine, be forthcoming. The two sets of observations—those from India and those from South Africa—should furnish data for estimating the influence of inoculation in lessening the soldier's liability to contract, or to die from, this form of fever, and it is quite possible that the returns from South Africa may turn out to be the more valuable of the two. According to official reports extending over many years it seems to be, statistically speaking, a well established fact that the susceptibility of British troops under a short service system to contract enteric fever in India is most marked during their first and second years of service in that country, and notably during the first year. In the report of the Sanitary Commissioner with the Government of India for 1898, for example, we find that the ratio of mortality from enteric fever per 1000 of strength was greatest in the age-period 20 to 25. As regards residence in India, the ratio of mortality from enteric fever per 1000 of strength was highest in the first year of residence. The total number of deaths from enteric fever in the first year of Indian service was 236, and 70 out of every 100 deaths from all causes were from enteric fever. Out of the total number who died at all periods of residence from enteric fever forty-one per cent were in their first year of Indian service. These general results are, moreover, only confirmatory of those which have long been set forth in the official reports of former years. It may be pointed out, therefore, that any preponderance of soldiers in their first year's service on one side or the other—inoculated or uninoculated—might prove very misleading.

The figures showing the results of inoculation might not be fairly representative of the advantages it confers where the subjects of inoculation were mainly composed of the class most susceptible of being attacked by enteric fever; on the other hand, the figures might unduly exaggerate the advantage where the least susceptible happened to form the majority of the inoculated class. It is highly probable, of course, that the troops serving in India have not been in any way specially selected, but have been taken indiscriminately and as a mere matter of convenience, as they voluntarily offered themselves for inoculation; in which case there would be no such disparity between the inoculated and uninoculated as would practically affect the results of a comparison being made between them. The returns obtained from the troops serving in South Africa will not be open to any fallacy of this sort. The aggregate number of troops is very large; they are, or were, nearly all of about the same length of service in that country—that is, in their first year—and have all been subjected to the same or very similar conditions. The troops that came from India may, it is true, have already paid their tribute and have acquired immunity owing to their having been previously attacked with enteric fever

whilst resident in that country, but the Indian contingents form no preponderating part of the army in South Africa. When all the figures bearing on inoculation against enteric fever and derived from observations made upon the army in South Africa are forthcoming we ought to have a good guide to the value of the treatment.

Supposing the protective influence of inoculation against enteric fever to be established as the result of these investigations, there still remains several points that will have to be determined before it can be generally applied as a practical measure—for example, the degree of immunity which it confers and for what length of time it confers it. It need scarcely be said that the subject is not merely one of scientific or medical interest. It is devoutly to be wished that the evidence of figures and experiments, with which we have yet to be furnished, may prove sufficient to put the value of inoculation against enteric fever on a secure basis as a scientific and successful method of therapeutics. If this should turn out to be the case, Professor Wright will have conferred an inestimable boon not on the British army only but on humanity in general.—*The Lancet*, Feb. 16, 1901.

ON THE USES OF FORMALIN IN GLYCERIN.

In the London *Lancet* of February 16, 1901, JORDAN tells us that as formalin is so powerful an antiseptic its use for clinical purposes has tempted many, but in every case, so far as is known, the attempt has been abandoned on account of the irritating nature of formalin and the pain which its use has involved. It has been found that this difficulty can be to a great extent overcome by using glycerin instead of water as the medium by which to convey the formalin to the required part. For ten months the author has used a mixture of formalin in glycerin, from one to four per cent. Although the mixture will keep without much diminution in strength for several weeks in a well-stoppered bottle in a cool place, it is better to prepare it fresh for use each time by mixing from one and a half to five minims of formalin with two fluidrachms of pure glycerin. This preparation is useful in at least four different ways: (1) as an application to the throat; (2) as a mouth-wash; (3) as an application to the skin; and (4) as a urethral injection.

1. *As an Application to the Throat.*—An ordinary pharyngeal brush is employed. A single application can be absolutely relied upon to kill every microorganism with which it comes in contact. Bacteriological examinations prove this. The glycerin spreads readily over the surface beyond the immediate limits of its application; it conveys the formalin into the follicles of the tonsils and into the deep layers of the mucous membrane. In follicular tonsillitis in the early days, when there are no deep collections of pus, formalin in glycerin (two, three, or four per cent) is a specific. After a single thorough application the temperature falls to normal within a few hours, and remains normal. The application is usually attended by a little soreness lasting only a few hours. For from half an hour to an hour after the treatment the patient should not be allowed to drink, the formalin being left undisturbed to exert its bactericidal action. After this, a simple gargle, such as chlorate of potash, is all that is necessary. In diphtheria, in cases where the membrane is confined to the pharynx, formalin in glycerin is equally successful. In most cases, however, there is membrane in situations inaccessible to a brush, as in the nares or in the air-passages. In such cases formalin in glycerin is of little use. In scarlet fever, where the throat condition is but a small part of a general disorder, one cannot expect much good from formalin; but even here two per cent of formalin in glycerin every second or third day is certainly as good as any other local application of which we have knowledge.

2. *As a Mouth-wash.*—In aphthous stomatitis and in parasitic stomatitis (thrush) a single application of formalin in glycerin, two per cent, should be made, and followed by the use of the glycerinum acidi borici of the British Pharmacopœia. In ulcerative stomatitis a single application does not appear to do much good, and it is not certain that formalin always accelerates the healing of the ulcers to an appreciable extent. Combined with iodine and with B eucaine (the latter as a local anesthetic), in the following proportions, a useful mouth-wash is afforded: One per cent of formalin, two per cent of iodine, and two per cent of B eucaine, in glycerin.

With this and the internal administration of chlorate of potash good results are obtained. In gangrenous stomatitis (cancrum oris), while not having an opportunity of trying formalin, the author believes that at the commencement four-per-cent formalin in glycerin might penetrate sufficiently deeply to put a stop to the disease. Tuberculous ulcers of the pharynx, mouth, tongue, and lips, occurring as they do in the broken-down subjects of advanced phthisis, are never hopeful cases to treat. They are always liable to reinfection from the lungs, and therefore repeated applications are necessary. But these repeated applications are not well tolerated on account of the great tenderness of the ulcers. In one case of tuberculous ulcer of the lower lip four-per-cent formalin in glycerin was applied very thoroughly twice a week by previously placing in contact with the ulcer a piece of absorbent wool soaked in B eucaine four per cent. In the intervals the ulcer was protected as far as possible by boric ointment. Considerable improvement occurred at the end of a fortnight, but the patient was not kept under observation.

3. *As an Application to the Skin.*—Formalin may be thus employed in all parasitic diseases, but especially in tinea tonsurans (ringworm). The whole area is thoroughly cleaned by turpentine, followed by soft soap and water to remove grease, and four-per-cent formalin in glycerin is rubbed carefully in by means of a piece of lint soaked in it. If there is much inflammation a piece of lint soaked in the formalin and glycerin is simply applied to the surface and left so for a few hours, protected by a layer of wool. This application never requires to be repeated. A little boric or zinc ointment or lead lotion will complete the cure in a few days. This treatment, in the experience of the author, has never been known to fail. Some cases of lupus ought to be readily curable by a few applications of four-per-cent formalin in glycerin on lint, but this important point has not as yet been tested.

4. *As a Urethral Injection.*—In one case of acute gonorrhea one and one-half drachms of one-per-cent formalin in glycerin was injected, with the result of completely and permanently curing the case. But for three days after the injection there were considerable pain and difficulty of micturition, due, no doubt, to swelling of the mucous membrane. For this reason the author is not confident in recommending its general use as a urethral injection.

Other uses of formalin in glycerin will doubtless suggest themselves to the reader.

A REPORT OF THREE CASES OF THORACIC ANEURISM TREATED BY SUBCUTANEOUS INJECTIONS OF GELATIN.

After detailing three cases treated by this method in the *Medical News* of March 16, 1901, CONNER tells us that of the three cases two received three injections and one seven. In two cases the injections had to be discontinued because of the severe local pain. In the third the pain was only slight. In one case, that receiving seven injections, a very slight improvement could be detected. In one case a slight increase in symptoms was noted, while the third case died of rupture of the aneurism while under treatment, and the autopsy showed no evidence of recent thrombus formation, although the condition, that of a large sac with a small communication with the aorta, was an especially favorable one for clotting. Aside from the pain and local irritation no untoward symptoms were observed in any of the cases as a result of the injections. No conclusion is reached from these cases that the method has no therapeutic value, since in none was it possible to carry out the treatment fully. Lancereaux believed, however, that he could see very distinct improvement even after a single injection. Certainly no such satisfactory result was apparent in any of the present cases. Futcher gives his results in nine cases as follows: While no case was cured there was a considerable diminution in the size of the aneurism in one, and in several others an appreciable reduction in the subjective symptoms referable to pressure. He believes the treatment to have some merit. Futcher also found that the injections were frequently very painful and were followed by local reaction, fever, and even chills.

It must be remembered that the administration of twenty injections would consume approximately five months of time, and that during this period the patient must be kept absolutely quiet in bed. Rest in bed for such a length of time would of itself in many cases produce a distinct amelioration of the subjective symptoms,

and even some improvement in the physical signs.

These cases at least are convincing that whatever the curative value of the treatment, its usefulness is seriously impaired by the severe pain which frequently follows the injections.

TREATMENT AFTER ABDOMINAL OPERATIONS.

In the *Clinical Journal* of March 13, 1901, BIDWELL gives the following important rules for these cases:

Management of the Bowels.—In abdominal operations, not only is it advisable to clear out the intestine thoroughly before the operation, but the bowels should not be allowed to become constipated after the operation. Especially when nutrient feeding is employed is it necessary to wash away the unabsorbed residue each day. In every abdominal case our wish is to prevent any stasis of the intestinal contents due to the temporary paralysis of peristaltic action by exposure, or the application of irritating antiseptics, and we must use every endeavor to reestablish the normal peristalsis as soon as possible.

At this point attention is drawn to the condition known as pseudoileus, which is a form of intestinal obstruction brought about by paralysis of the gut from exposure or injury, and is often combined with the formation of adhesions in such a position as to cause a kink. The condition is naturally not common after operations on the stomach, as the lower part of the small intestine is seldom exposed; it is, however, fairly common in operations on the lower part of the abdomen. It has often been confused with peritonitis, and has led to the supposed cure of peritonitis by purgatives; there are, however, no signs of peritonitis post mortem in fatal cases. Pseudoileus differs also from other intestinal obstruction by its rapidly fatal course if unrelieved, death being probably due to the migration of the bacillus coli communis from the paralyzed gut into the peritoneal cavity, and by the absorption of its toxins therefrom. In order to guard against this condition, which arises from paralysis of the gut, as well as for other reasons, our aim must be to reestablish the normal peristaltic action as quickly as possible. The first means by which we attempt to do this is by the passage of a flatus tube about four or five inches up the rectum every four hours, immediately before each nutrient injection is given; this enables the gas to be expelled by the enfeebled peristaltic contraction, which would otherwise not have sufficient force to conquer the resistance of the anal sphincter; early feeding, too, will help our object, and hot fluids by the mouth, together with the avoidance of ice, and of milk, are more conducive to the production of peristaltic action than starvation and ice. The most important point, however, is to obtain an early action of the bowels by means of an enema. This should be given on the second or third day after the operation, and may contain some purgative drug in addition (a list of some of the purgative enemata is given below). Some surgeons recommend a purge as well: thus, Spencer gives calomel on the second day, but the author relies first on the action of enemata, and gives a purge by the mouth only if the enemata are unsuccessful. In such a case he gives two grains of calomel, followed by an ounce of mist. sennæ co. or a pill containing calomel and colocynth, or an ounce of mistura magnesii carbonatis and magnesia sulphate, to be repeated every two hours. In cases where aperient medicine cannot be given by the mouth in consequence of vomiting, and no result has followed a simple enema, we must rely upon the use of purgative enemata, the most useful of which are the following:

1. Ol. ricini, turpentine, ää 1 ounce, in 10 ounces of thin gruel.

2. The British Pharmacopœia enema terebinthinæ, containing 1 ounce of turpentine to 15 ounces of mucilage of starch. Both these preparations, however, are rather strong, and the author usually employs an enema of one pint of gruel containing one to two drachms of turpentine.

3. Enema sulphate of magnesia (or enema catharticum, B. P.): Sulphate of magnesia 1 ounce, olive oil 1 ounce, mucilage of starch 15 ounces.

4. Enema of aloes (B. P.): Aloes 40 grains, carbonate of potash 15 grains, mucilage of starch 10 ounces.

5. Enema of colocynth contains extract colocynth ½ drachm, soft soap 1 drachm, water 1 pint.

6. Enema of glycerin one to two drachms injected undiluted, or in the form of a suppository. This latter, however, is

not of much use immediately after an operation, and may cause tenesmus.

A good number of cases of operations on the stomach never require any aperient, and the bowels act naturally on the second or third day; in some cases also the other extreme is reached, and very troublesome diarrhea follows, which has caused a fatal issue in several cases without leaving any signs at the post-mortem. In such cases the amount of liquids given should be diminished, and tincture of opium must be administered by the mouth, and the stomach washed out; this will usually suffice to stop the diarrhea.

Rectal Feeding.—As some amount of rectal alimentation is required in most abdominal operations, and in nearly every one on the stomach, some account of the best form of carrying this out will be useful. In the first place, before commencing nutrient enemata it is best to thoroughly wash out the bowel with normal saline solution; this must be repeated each day to remove the débris. The patient should be lying on his back, and should not change his position for some time after the injection. The best method of introduction is to use a soft-rubber rectal tube the size of a No. 12 or No. 14 catheter, which should be passed about six inches up the rectum; connected with the tube is a funnel, which should be raised two feet above the bed. This is better than a syringe, since the fluid will flow more evenly and slowly into the rectum, and so is more likely to be retained; the risk of forcing in air, too, is diminished. The whole enema should not exceed six ounces in bulk, and in some irritable rectums only three or four ounces should be given; it should be of a temperature of 100° F., and should be given every four or six hours. Practically only substances in solution can be absorbed from the rectum, so unpeptonized milk or beef tea is useless; stimulants, such as spirits, wine, tea, or coffee, are most readily absorbed, but extractives and peptones are also of value. The necessity of giving digested meat has been recognized for a long time, but the process of preparing the enemata has been much improved by the introduction of the various peptonizing and zyminising powders now on the market. The older enemata were prepared with fresh pancreas. The following are a few of the best:

1. Von Leube's: Five ounces of finely scraped meat is chopped very fine, and to this is added one and a half ounces of finely chopped pancreas; the whole is suspended in three ounces of lukewarm water, and stirred to the consistence of a thick pulp. This makes one injection.

2. Mayet's: 150 to 200 grammes of pancreas is bruised in a mortar with tepid water at a temperature of 100° F., and is then strained through a cloth; 400 to 500 grammes of lean meat is chopped fine, and the strained pancreatic fluid is mixed with the mince, together with the yolk of one egg. This is allowed to stand for two hours, and administered at the body temperature; the quantity is sufficient for twenty-four hours' nourishment, and should be administered in two parts.

3. Rennie's: Half a pound of lean meat is pulled into shreds and added to a pint of beef tea; to this is added one drachm of fresh pepsin, and half a drachm of dilute hydrochloric acid; the mixture is kept at a temperature of 99° F. for four hours, during which it is stirred constantly. If too great heat be employed the digestion will stop.

4. The enema which the author employs is made as follows: Milk 2 ounces, strong beef tea 2 ounces, yolk of egg 1, pancreatic solution 1 drachm. This is to be prepared one hour before use, and to be kept at a temperature of 100° F. One-half to one ounce of brandy is added, when necessary, immediately before use.

5. Terrier and Hartman recommended the following: Peptones 20 grammes, infusion of tea 100 grammes, benzo-naphthol ½ centigramme, tincture opium 5 minims. Four of these are given during the twenty-four hours.

6. Greig Smith: One egg is beaten up in six ounces of milk, and two or three teaspoonfuls of meat jelly or peptones added. This is administered warm with or without half an ounce of brandy every five or six hours.

7. Hunter Robb: Peptonized milk 1 ounce, whiskey ½ ounce, the whites of two eggs, common table salt 14 grains.

Nutrient suppositories are also used when the rectum is intolerant of injections, or they may advantageously be used alternately with them in cases requiring several days' rectal feeding. If used alone they must be supplemented by an injection of about half a pint of hot saline solution once or twice a day. The suppositories are usu-

ally made of peptonized beef, a chocolate-colored paste, which is prepared by digesting beef with acidified fresh gastric juice, and then concentrating the solution. The suppository contains thirty grains of this, and is stiffened with cacao butter. These suppositories are made by most wholesale chemists, and keep for only a short time after the box is opened. It is best to use them as freshly prepared as possible.

Lastly, Sansom has recommended the use of blood as an enema. Ox blood is usually employed, and must be defibrinated first; this can be got from a butcher by asking for whipped blood. It must be fresh, and will not keep more than one day. By the addition of one and a half grains of chloral to one ounce of blood all offensive odor is prevented. It is usual to inject two or three ounces of blood every two or three hours.

In cases where rectal feeding has to be continued for any length of time it is well to change the composition of the enemata, since the rectum does not appear to retain any one kind of enema after a time. If, too, the rectum be irritable, two or three minims of tinctura opii should be added to each enema. Some surgeons also add some disinfectant to each enema, either betanaphthol or salol; from two to five grains of each can be given. Alcohol also acts as a disinfectant, as well as a stimulant, so this is an additional reason for adding either brandy or red wine, as suggested by Ewald.

Lavage.—If vomiting and eructation continue after the second day, and especially if at the same time the temperature be elevated, the mouth dry, and the tongue sticky and coated, it is almost certain that there is some decomposition of the stomach contents. If these contents be allowed to remain in the stomach, they will probably produce a fatal issue, either by setting up diarrhea, by keeping up vomiting, or by absorption of toxins. It is very important that they should be removed at once; to do this a stomach-tube must be passed, and the stomach thoroughly washed out with some antiseptic, such as salicylic acid, followed by plain boiled water, which must be continued until the fluid returned is quite clear. Feeding must be recommenced immediately after the lavage, as this will be a favorable time for the absorption of some nourishment. The lavage must be repeated on the next day if vomiting or eructation continue. In some cases it may require to be done daily for five or six days.

Some hesitation might be felt at passing a stomach-tube forty-eight hours after suture of the stomach, and injecting water to wash out its contents, since this might place a strain on the stitches; however, it is far better that a suture should undergo a slight strain than that it should be soaked in a putrid liquid; besides, the wound in the stomach is firmly sealed at the end of forty-eight hours, and will practically be as water-tight then as it will ever be. The lavage, of course, must be done gently, the patient lying on his back, and the fluid introduced by means of a funnel which must not be more than three feet above the patient's head; it is removed by siphon action, not by expression.

Mouth and Teeth.—Before an operation special attention was drawn to the importance of rendering the buccal cavity as aseptic as possible, so also after an operation on the stomach this point is still worthy of remark. The teeth should be gently brushed with some antiseptic tooth-powder at least twice a day, commencing on the day after the operation, and the mouth rinsed out with boric solution, or with peroxide of hydrogen. All accumulation of food and sordes should be removed from the gums and teeth by means of a small piece of wool soaked in dilute carbolic or boric lotion. Attention to the state of the mouth is of importance not only in preventing decomposition of the stomach contents, with consequent vomiting and diarrhea, in preventing septic bronchopneumonia, which has been a fruitful cause of death after stomach operation, but also in preventing the formation of a parotid bubo which may lead to suppuration, and exhaust the patient's strength.

Position of Patient.—As before stated, the patient need not lie flat in bed after stomach operations, especially after gastro-enterostomy, since the escape of contents out of the stomach is facilitated by the patient being slightly propped up. In some cases, too, turning on the right side also facilitates the outflow of stomach contents. It is unnecessary to state that the patient must not move himself, but must allow the nurses to change his position. This change of position also has an influence on the bowels, since it often relieves the condition

known as pseudoileus, which has been already referred to.

In a simple uncomplicated case of abdominal section, the patient should be kept in bed for fourteen days, and may then be moved on to a couch; but she should not be allowed to walk until the end of three weeks; in hospital practice the patient usually leaves the hospital at the end of a month.

Peritonitis should never occur after any operations on the stomach, with the exception of those for perforating gastric ulcer where it has existed before the operation. In any other operation it can only occur after faulty suturing, or where septic material has been introduced either by the surgeon's hands, instruments, ligatures, or sponges. In cases of operation for septic tubal abscesses, or for those connected with the vermiform appendix, peritonitis is a real danger, and may occur after imperfect cleansing of the cavity; it is best treated by thorough and prolonged drainage.

There are two other points which require notice; the first is the administration of morphine, and the second is the admission of visitors.

Many surgeons have a great prejudice against the use of morphine hypodermically during the first days after an operation; the author does not consider that it should be given until the bowels have been opened, on account of the bad effects which it often produces. These effects are persistent vomiting and delay in the reestablishment of peristaltic action, and consequent pseudoileus and adhesions. Other surgeons, especially Spencer, make a rule of giving morphine and atropine every three hours or so, so as to prevent vomiting. Maylard also recommends a hypodermic injection of one-sixth to one-quarter grain of morphine, and repeated if necessary; Villard, too, gives morphine, except in feeble patients, where stimulants are indicated in its place. It certainly has some depressing effect, and if it produces vomiting it takes away the only chance of recovery from a feeble patient. At any rate, its use is not advised.

THE TREATMENT OF ENDOCARDITIS.

NEWMAN states in the *Physician and Surgeon* for March, 1901, that the medicinal treatment of failure of compensation in heart lesions is very often quite brilliant. He does not attempt to go into the treatment as it affects the diseased condition of one or the other valve—indeed, such a classification is not necessary. The objection that digitalis is contraindicated in aortic regurgitation because the lengthened diastole allows more time for the blood to run back into the ventricle is well taken. It is easy to see that in this manner such anemia of the brain may be produced as to cause syncope or even sudden death; but even these dangers are lost sight of as the heart becomes more enfeebled and dilated, so that the mitral valves no longer close, and the resulting venous stasis and pulmonary embarrassment demand the administration of digitalis at all hazards. In all forms of cardiac dilatation from valvular lesions, therefore, a sheet-anchor is digitalis. It is absorbed slowly and eliminated more slowly, so its action may continue for days. No other drug exerts such a tonic effect on the heart muscle. This it accomplishes by lengthening the diastole, which is the period of repair of the heart muscle. It is unnecessary to add that its effects must be closely watched and its so-called cumulative action avoided. If a dilating heart does not respond to digitalis within a few days, it generally indicates that the compensation is gone forever.

Strophanthus, next in importance to digitalis, is less cumulative in its action, less liable to derange the stomach, and often induces free diuresis when digitalis has failed in this respect. Strychnine is one of the best cardiotonics, and given in doses of one-sixtieth to one-thirtieth of a grain can be continued almost indefinitely.

Caffeine has a very uncertain if any action on the heart, but a very decided action on the kidneys. As a diuretic it is the most important of the heart drugs, and is, therefore, of the greatest value when there is renal suppression and dropsical effusion.

Probably the most abused of the heart drugs are nitrites. They are the most powerful depressants of blood-pressure known. Nitroglycerin has no action on the heart, but decreases the resistance against which the systole is performed. It must be remembered that the effect of nitroglycerin is very fleeting. Its physiological action is produced in about two minutes and is gone in forty minutes.

In closing Newman mentions a few of the symptoms of cardiac dilatation in de-

tail, because much can be done to relieve the patient beyond the routine treatment of the heart.

For the palpitation we have a measure of relief in the ice-bag, the belladonna plaster, and morphine hypodermically.

The dyspnea of heart disease has a cardinal remedy in nitroglycerin. Many patients carry one-hundredth grain tablets constantly with them, and find it absolutely impossible to live without it.

The enlargement of the liver, beyond its treatment from the heart, can be benefited by an occasional dose of calomel or phosphate of soda, one to three drachms in hot water three times daily.

The bronchitis is largely relieved by the treatment of the heart, but occasionally codeine or morphine or hydrocyanic acid will give relief. At the present time the author is treating a patient with cardiac dilatation associated with aortic stenosis and mitral insufficiency in whom the coughing and vomiting from congestion of the lungs and stomach were almost incessant, and day or night he was unable to lie down. He passed the dreaded nights without sleep, harassed without ceasing with his cough and his stomach. For a week in addition to the heart treatment he has tried codeine, morphine, hydrocyanic acid, bismuth, etc., without result. One-twelfth grain of heroin every two hours three times stopped alike the cough and the vomiting for three days, after which it had to be repeated.

The anasarca should be treated promptly, and the lymphatic spaces cleared. Puncturing with a large sized needle, with all aseptic precautions, will often give the greatest relief to the patient, frequently with the disappearance of the asthma, the edema of the lungs, the palpitation, and other symptoms.

THE VALUE OF ALCOHOL IN THE ACUTE INFECTIOUS DISEASES OF CHILDREN.

BIESER states in *Pediatrics* for April, 1901, that it may be conceded at the outset that in the acute infectious diseases of children, such as diphtheria, measles, scarlet fever, pneumonia, typhoid, the three following physiological functions are always more or less disturbed, viz.: (1) vital function of nutrition; (2) vital function of animal heat production; (3) vital function of correlation of energy.

What agencies, barring specific remedies, or hydrotherapy, or removal of cause where possible, hamper the *vis medicatrix naturae* less in the diseases above stipulated than alcohol judiciously used? As a result of his practical experience the author hopes to convince his *confrères* that instead of hampering the organism in its benign fight to throw off disease, alcohol really aids the natural recuperative forces of the body.

What single drug so well meets the three disturbances of vital function just mentioned?

1. Vital function of nutrition. By saving nitrogenous waste, as is evidenced by diminished excretion of urea, it certainly aids indirectly, at least, in restoring the vital function of nutrition in diseases where tissue-makers must be barred from the dietary. Barring tissue-makers, what better substitute for food than a tissue-saver like alcohol can we find?

2. Vital function of animal heat production. By virtue of its making adequate provision for proper heat elimination from the periphery of the body—for it must be remembered that fever in general, and especially in the infectious diseases, is due rather to diminished elimination of heat than to increased production of heat—alcohol reduces the fever, thus keeping the vital function of animal heat production at its proper balance. Is this a hindrance or an aid to *vis medicatrix naturae?*

3. Vital function of correlation of energy. Alcohol in a healthy person increases frequency and force of the heart's action; in a heart weakened by fever and depression therapeutic doses (where the heart is rapid but feeble) increase the force by diminishing the frequency of the cardiac pulsations; the working power of the heart is increased in both instances. By keeping the pulse-respiration ratio as near to four to one as possible alcohol assists the natural recuperative powers of the organism in restoring the above vital function of correlation of energy.

By correlation of energy is meant mutual conversion of energy, that converted energy is never lost, merely transformed. Thus, in a child whose vital functions are merely depressed, not exhausted, alcohol can induce the proper circulatory energy; this, in turn, is apt to induce the proper respiratory energy; both of these in turn are apt to cause the proper secretory and excretory

energy, one being, as it were, dependent to a large extent upon the other.

Coming down to the practical part of his paper—the treatment of diphtheria, scarlet fever, measles, and pneumonia by alcohol—we can see whether the results of treatment in actual practice warrant the encomiums bestowed upon it in the preliminary discussion of the chemico-physiologic virtues; for clinical results after all transcend in value, at least as far as our little patients are concerned, the most learned and brilliant theoretical disquisitions. If any one can give sufficient reasons to show that alcohol alone has snatched the severest types, or even only one very severe type, of any of the above diseases from the jaws of death, he has shown that alcohol has been weighed in the scale of experience, and has not been found wanting.

RHUS GLABRA IN ENURESIS.

CASSIDY (quoted in *New York Medical Journal*, March 16, 1901) reports three cases of nocturnal enuresis in boys of from twelve to fourteen years of age, in which other treatment had proved unavailing, successfully treated as follows:

Citrate of iron, 160 grains;
Syrup of lactophosphate of lime,
Aromatic syrup of cascara, of each 2 ounces.

M. A teaspoonful after dinner (noon).

Fluid extract of rhus glabra, 320 minims;
Syrup, to 2 ounces.

M. A teaspoonful at bedtime.

This treatment was continued for four months. The incontinence disappeared and did not recur. The author declares that rhus glabra produced more than a temporary effect.

OPERATIONS ON DIABETICS.

It is a generally accepted view (editorial, *Medical Press*) that surgical operations on diabetic subjects are attended by so much more than the usual amount of risk that, under ordinary circumstances, they are best avoided. In the abstract, no doubt, this view is correct, but there are circumstances and cases in which the objection does not hold good. No surgeon would refuse to operate, for instance, on a diabetic subject who happened to have a strangulated hernia or other form of acute intestinal obstruction. In general, when non-intervention would entail inevitable death it is the surgeon's duty to shut his eyes to the diabetic complication and to operate. Apart from these operations of urgency the advance of medical science renders it possible to operate on diabetic subjects with a fair prospect of a happy issue, provided that proper precautions are taken to restrict the quantity of sugar in the system. The question came up before the Royal Medical and Chirurgical Society on a paper read by Mr. Barker, who was enabled to relate two very successful cases of intestinal surgery in diabetic subjects, showing that even under the most unfavorable circumstances surgical intervention in such patients is not necessarily a forlorn hope.

From the point of view of surgical risk diabetics may be divided into two categories. First of all, the presence of sugar in the urine is a symptom the significance of which varies greatly according to the age of the patient. In an elderly person of full habit it hardly constitutes a contraindication, whereas in a young person diabetes runs a much more rapid and fatal course. Looking at the question from another point of view, diabetics may be divided into two classes, one in which the sugar is of purely alimentary origin, in which a proper supervision of the diet will suffice to reduce the sugar in the urine to negligible proportions. A glycosuric person in whom the excretion of sugar can thus be controlled may, for surgical purposes, be regarded as one of average resistance and dealt with accordingly. There are other cases, however, cases of true diabetes, in which the sugar is only in part derived from the carbohydrates taken as food, a variable proportion thereof being of tissue disintegration. In these, diet, however strict, does not remove the sugar from the urine, and the gravity of the prognosis is proportionately grave. Obviously it is for the surgeon to ascertain as far as possible into which category his diabetic patients fall, because in the latter class even the most trifling surgical operation may be attended by the most serious risk to life. The ease with which trifling traumatisms determine grave constitutional disturbance in diabetic subjects is extraordinary, as every practitioner knows to his cost.

Unfortunately, the distinction between the two classes does not work out as satisfactorily in practice as it does in theory. In many, possibly the majority of instances, the cases are on the border-land, and

though diet does to some extent diminish the excretion of sugar, there still remains enough to inspire anxiety as to the possible results of surgical intervention. In these cases prudence is the best counselor, and as a general rule no operation except of the imperative kind should be performed. While medical science enables us to place certain diabetics in a comparatively satisfactory state for operation, it does not divest the presence of sugar of its fell significance, especially when observation shows that the sugar is not exclusively of alimentary origin.

SIMPLE OPERATION FOR HEMORRHOIDS —ENUCLEATION.

PENNINGTON *(International Journal of Surgery,* December, 1900) describes a simple operation for hemorrhoids that he has employed in about fifty cases, and which has proved more satisfactory than any other method.

The second night before operation there is administered to the patient from two to three grains of calomel in combination with subnitrate of bismuth and pepsin. The following morning there is given Rochelle or Epsom salts. The night before the operation the anus is shaved, the patient bathed, and the colon flushed. At seven o'clock the following morning there is given an enema of from one-half to one pint of cool water, and the operation takes place two hours later.

The patient, after anesthetization, is placed in the Sims posture. Pennington has devised a special table for rectal surgery which he uses in the operation. The sphincter is carefully and gently divulsed with the fingers, and the rectum is irrigated with an antiseptic solution, usually bichloride of mercury 1:3000, followed by sterilized water. A strap is then placed over the patient's right shoulder to prevent slipping, and the table is tilted to place him in the proctoscopic posture, equivalent to the extreme Sims or knee-chest posture. A tubular speculum is then introduced, and the entire rectum, valves, chambers, and part of the sigmoid carefully examined. If any tumors, deformities, or obstructive valves are noticed, they are given immediate attention. Polypi are ligated and removed. If there is a history of constipation, and if one or more of the rectal valves obstruct evacuation, there is applied an automatic valve-clip. This clip divides the valve painlessly and effectively by pressure necrosis. In this manner the obstruction is removed, and the caliber of the bowel at that point is increased. By this method the author has been very successful in curing constipation in patients who have been operated on for hemorrhoids.

The table being turned to its normal position, the patient is retained in the lithotomy posture by means of the Clover crutch. The rectum is reirrigated, and each anal quadrant grasped at the mucocutaneous junction with a pair of T-forceps, which are held by an assistant. With them the anus is everted, and the internal tumors exposed. Now seizing with a full hand the forceps attached to the posterior quadrant, the author fully everts it, and with a pair of scissors curved on the flat he cuts off the redundant tissue only, which is usually about one-third or one-half of the uppermost part of the hemorrhoidal node. The blood of the tumor is thus permitted to escape. All angiomatous tissue is carefully removed, when the remaining wall collapses. This leaves a very small area, if any, of denuded surface. Each quadrant is treated in regular order in this manner. A stream of hot water, sterilized, flows over the field continuously during the operation. Spurting vessels are caught with a pair of forceps and thoroughly twisted. The T-forceps are removed, and all external tumors and tabs of skin cut off with a pair of straight scissors. The field is then dusted with nosophen powder, and a rubber-covered tampon is introduced through a bivalve speculum.

The tampon is allowed to protrude about one and a half inches. Gauze is carefully wrapped around the protruding part, and packed close to the anus. An anchoring string is wrapped around a piece of gauze held close to the end of the tube to prevent its slipping into the rectum. Over this is placed gauze, cotton, and a T-bandage, which should be taut. The patient is now placed in bed.

At the end of forty-eight hours a cathartic is given, and the tampon is removed.

Until convalescence, the parts should be washed or irrigated twice a day with an antiseptic solution, and dusted with some powder, as iodoform, boracic acid, or nosophen. The last is preferred. After the bowels have moved, the patient is instructed to keep them soft for two or three weeks. For this purpose there is frequently pre-

scribed compound licorice powder. Apenta water is also effective. If there is a pain or aching sensation, a hot sitz bath of twenty minutes' duration is given. As a detergent, small pieces of wet cotton or cottonoid are used. Hard substances should not be employed for this purpose.

Rubber dressing is found best because it is neater, its removal is painless, and the healing process is greatly enhanced. There is also little or no danger during the first and subsequent movements of the bowels.

The operation is quickly and easily performed. Patients suffer little or no pain, are out of bed in a week, and often in less time.

PERFORATION OF THE INTESTINE IN TYPHOID FEVER.

JOPSON *(University of Pennsylvania Medical Bulletin,* March, 1901) presents a careful digest of recent literature upon perforation of the intestine in typhoid fever, and notes that it is conceded by all that in the future the surgeon will often be found in consultation at the bedside of the typhoid case.

Prognosis of typhoid perforation without operation is bad. A few cases undoubtedly recover—five per cent according to Murchison. Some of these are probably appendicular perforations in a quiet corner of the abdomen.

In the operative cases, taking Keen's combined tables, including 158 cases, 23.41 per cent recovered, and of the last 75 cases, 28 per cent. This may be raised, if the value of operation is properly appreciated, Keen thinks, to 33 per cent. Of Finney's series of 112 cases, 23 recovered. Of the 21 cases in the Boston series, 3 recovered. Of 16 cases from Osler's wards, 6 recovered. It seems probable that the Boston series represents more nearly the mortality up to date than do the tables of Finney and Keen, as the first is taken from the hospital records including all cases, and the latter from general literature, where favorable cases of any kind may be expected to be more frequently reported in proportion to the whole number than the unfavorable ones.

Cases in fair condition bear laparotomy well, and the subsequent course of the disease even seems to be sometimes favorably influenced thereby. Children under fifteen seem especially resistant, furnishing the highest percentage of recoveries in Keen's tables.

Cases taken early, before general peritoneal infection sets in, should be placed in a separate series.

As to the technique of operation, the indications for incision in the right iliac region instead of in the median line are now generally recognized. Excision of the ulcer is not to be recommended. Any tight method of suturing may be practiced, mattress sutures being especially useful, and care being taken not to decrease too much the caliber of the bowel. Large ulcers may demand resection of bowel or establishment of an artificial anus. Thinned areas threatening perforation should be turned in. The possibility of two perforations must not be forgotten. Perforation may rarely occur in the cæcum and sigmoid. Irrigation is demanded, and thorough wiping out with gauze useful. Drainage is recommended for general peritonitis, and for most cases without it, although the Hopkins surgeons make a reservation in favor of the usefulness of pure postural drainage in these cases.

Laparotomy under cocaine is quite feasible. Its use in mild typhoid is deprecated as unnecessary by the Boston committee. They consider, also, that the manipulations and other incidents attendant on a laparotomy on a conscious patient are likely to cause more shock than ether judiciously administered. Spinal anesthesia may be useful in this domain.

As to the time of operation, Keen's tables show a higher ratio of recovery in the second twelve hours, and so he deprecates operations in the stage of initial shock if such be present, at the same time not losing sight of the dangers of increasing infection. Taylor suggests that such shock may be due to an outpouring of septic material into the peritoneal cavity, and only to be combated by checking further infection. This is largely a theoretical question and will probably not often delay operation.

THE SURGERY OF THE TURBINAL BODIES WITH A NEW METHOD OF OPERATING.

BOYLAN *(New York Medical Journal,* March 9, 1901), in dealing with hypertrophy and degenerative changes in the turbinated bodies, noted the preponderance of hypertrophy in certain regions, principally at the

extremities, rather than in the central part of the bodies. He gradually resorted more and more to the removal of larger segments of the excessive tissue by one smooth operation. He now believes that in the advanced hypertrophy so frequently associated with interference with the respiratory function the judicious amputation of portions of the turbinated bodies will be the operation of the future in rhinology.

His conclusions, drawn from 111 turbinotomies in private practice, and from clinical cases of which a record has been kept, are:

1. That while in exceptional cases involvement of the whole erectile tissue area of the pendulous portion of the body may coexist, hypertrophy is usually greatest where this tissue is most abundant—at the anterior and posterior extremities.

2. That the relief of obstruction and the reduction of hypertrophy in these cases is accomplished more certainly and scientifically by ablation than by cauterization.

3. That while venous dilatation is greatest at the posterior extremities, obstruction is rarely due to hyperplasia at this point alone.

In the cases referred to, the lower part of the inferior turbinated body was removed throughout its entire length in three instances with the saw, and in twenty further cases sections embracing the anterior extremity with the same instrument. In twenty-four cases turbinotomy of the lower or middle body was performed with the scissors, or with the saw and scissors together, and in sixty-four cases sections of varying size were removed with the cold snare.

The snare, if the wire is stiff and thin, cuts through the tissue smoothly and usually with ease. The use of the saw and scissors was in time restricted to cases in which excessive induration suggested an exceptionally thickened bone.

To prevent accidents, the end of the loop is fixed by burying the point of a fine tenaculum, the hook of which forms a right angle, into the lower margin of the turbinated body at the point of operation, carrying the loop over its handle into the meatus and adjusting it so that it passes behind and is held in place by the back of the hook. By this means it is possible to entirely control the removal of the amount of tissue required, and combined, if necessary, with a lateral incision, amputation can be done with accuracy as far back as the middle of the body.

Boylan, finding that the point of the hook was at times caught in the loops, had this bent to an angle somewhat more acute than a right angle, and in operating it was tilted still farther forward by depressing the proximal end of the tenaculum.

During the manipulation the snare should be pressed firmly backward and upward, so that the loop is drawn above rather than from in front. The back of the hook is corrugated for the better retention of the loop.

The method described was not found applicable to cases in which the removal of the posterior extremities of the lower bodies was performed with a snare, this being usually accomplished by conjoined manipulation through the mouth—in two cases with great difficulty, twice under anesthesia.

In eighteen cases in which marked enlargement of the posterior extremities coexisted with causes of obstruction farther forward, such as polypi, hypertrophy at the anterior extremities, or of the lower margin of the body, and irregularities of the septum, the removal of the latter sufficed to restore the lumen of the passage, after which the posterior hypertrophy was no longer a source of serious annoyance, and in several instances receded rapidly under local treatment.

The indication, in the principle involved in turbinotomy, is to remove as little tissue as possible consistent with freeing of the passages from obstruction to respiration.

ICHTHYOL IN TREATMENT OF DEEP-SEATED INFLAMMATIONS.

SLEVIN *(New York Medical Journal,* March 9, 1901) gives the following formula for the relief of deep-seated as well as superficial inflammations:

> Ichthyol, 45 grains;
> Lead iodide, 45 grains;
> Ammonium chloride, 10 grains;
> Petrolatum, enough to make 1 ounce.

For the last substance, glycerin, rose ointment, or cacao butter may be substituted. It should be applied by rubbing upon the inflamed parts.

The results in acute inflammatory cases have been most excellent. The preparation is of great aid to absorption.

DIAGNOSIS AND TREATMENT OF LARYNGEAL CANCER.

MACKENZIE *(Bristol Medico-Chirurgical Journal,* December, 1900) opened a discussion before the American Laryngological Association, May, 1900, on the early diagnosis and treatment of laryngeal cancer. He gave three methods of arriving at a diagnosis: (1) The naked-eye appearances, combined with the clinical history; (2) thyrotomy; (3) microscopic examination of a removed fragment.

The first and second frequently go together, and a more extensive division of the cervical tissues than a mere laryngofissure is allowable in cases of reasonable doubt, or where one cannot otherwise define the exact territory occupied by the disease.

The removal of a piece for microscopic examination is a dangerous procedure, as it renders the patient liable to autoinfection or to metastasis. If reasonable doubt exists, it should not be done. Early and thorough removal is necessary, and as regards operation on one-half of the larynx, the other half that is left is not of much value for voice production. Intralaryngeal operations in extensive disease are to be condemned. Simple thyrotomy with curettage is a reversion to the status of fifty years ago.

Delavan remarked that of 163 cases occurring in the practice of eight European surgeons who had had at least ten personal cases on which radical operations were performed, only six per cent of recoveries took place.

Solis-Cohen called attention to the following points in the performance of laryngectomy:

(1) Operate with the head in a semi-inverted position, to prevent entry of septic matter into the lungs. (2) Preliminary tracheotomy should be done, otherwise we are troubled by the descent of the trachea. (3) If possible, retain the epiglottis. (4) Shut off all communication between the mouth with the air-passages. In attaching the upper part of the trachea to the skin, the tube should be slit longitudinally for a short distance. (5) All dressings should be avoided. Feed by enema, and use no tube by the mouth. Allow no packing, as it causes constant desire to swallow. (6) Remove the larynx from below upward, and elevate the foot of the bed after operation.

SECONDARY HEMORRHAGE AFTER USE OF SUPRARENAL EXTRACT.

HOPKINS *(Bristol Medico-Chirurgical Journal,* December, 1900) has found that suprarenal extract is apt to cause hemorrhage, and believes that after its use intranasal packing should be used in operations on the nose.

Swain has seen more hemorrhage when the extract and cocaine have been used in combination.

Farlow has not observed hemorrhage from it, but has had some remarkable cures of coryza from it.

Grünbaum points out that suprarenal gland extract does not cause coagulation, and so does not seal vessels with clots. It follows that unless the application is repeated there may be fresh bleeding. Hemorrhage from a small artery is more likely to be affected by it than capillary oozing from a hyperemic mucous membrane, since it acts by causing contraction of the plain muscle fibers of blood-vessels.

CARBOLIC GANGRENE.

SWAIN *(Bristol Medico-Chirurgical Journal,* December, 1900) notes that many surgeons have discarded the use of carbolic acid except for the immersion of instruments which are tarnished by solutions of mercury, but that it is not yet sufficiently known that this too popular antiseptic is liable to cause gangrene when applied to the extremities even in dilute solutions. The dilute solutions cause no pain, and are therefore the most dangerous.

Harrington has collected a total of one hundred and thirty-two cases of gangrene from dilute solutions of carbolic acid. It appears from his observations that the disease is due to the duration of the application and the thickness of the patient's epidermis more than to the strength of the solution.

Lévai is quoted as saying that strong solutions are less dangerous because they form a more or less impervious scab. According to the same observer, the death of the part is due to a direct chemical action on all the tissues. Carbolic acid has no specific quality for the production of the gangrene, for a like effect is produced by five-per-cent solutions of hydrochloric, nitric, sulphuric, and acetic acids, and of caustic potash when applied to an extrem-

ity by a moistened compress for about twenty-four hours.

Tight bandaging undoubtedly increases the tendency to this process, but experiments have shown that the gangrene does not result primarily from this cause. The treatment of this condition varies according to the severity of the process. If it seems superficial, and the case is seen soon after the removal of the carbolic dressing, it might be beneficial to apply a dressing saturated with lime water, but in other cases it soon becomes evident that amputation is the only resource.

The best prophylactic consists in the avoidance of the use of carbolic acid for wounds, and it is the duty of physicians to show by their example that the public should not make use of this antiseptic.

TREATMENT OF ACUTE GONORRHEA.

BALCH *(Boston Medical and Surgical Journal,* February 7, 1901) has had some people tell him that after a doubtful connection they always take an injection of a weak solution of permanganate of potash, and that they never became infected when they have done so. He thinks this is unwise for the ordinary run of people. He himself has irrigated the urethra of patients who came the day after with permanganate, 1-to-4000, or a four-per-cent solution of boracic acid. No gonorrhea followed; but Balch considers it doubtful if it would have followed anyhow.

He tells his patients that it is best to treat the case twice a day during the first week or ten days, letting the patient himself use injections two or three times a day for two or three weeks more. This procedure brings more comfort to the patient; there is less discharge, and recovery is quicker with less danger of complications. If the patient cannot give up so much time, he is given medicine, is seen perhaps twice or three times the first week, and then once a week for as long as it takes to effect a cure.

He has come to believe in only three injections—nitrate of silver, permanganate of potash, and protargol. He has been more successful in the early stages with nitrate of silver. The bladder is irrigated with plain boiled water, and all the water possible is stripped out. A syringeful of the silver solution is injected. One grain to the ounce is used if the lips of the meatus are puffy. If there is no evidence of very active inflammation, two grains to the ounce solution is used. It is allowed to escape after being held for about a minute, and the urethra is again washed with water. This procedure is followed twice a day, increasing the solution strength to two grains to the ounce the second day, and to three grains the next day. It is considered unwise to go higher than this. Scalding on micturition often ceases after the first injection. The discharge becomes thin and watery after a few days, and often ceases after five or six days. It is best to continue the injections a few days more, gradually decreasing the amount of nitrate of silver. If at the end of ten days there is no discharge, the patient may use an injection of permanganate of potash, two grains to sixteen ounces of water. He should begin by using it twice a day, and should continue to use it for two weeks or so. When permanganate of potash is used from the beginning, it is best to irrigate with a large amount of weak solution rather than with a little of a stronger one; 1-to-4000 is strong enough. A quart of the solution as hot as it can be borne comfortably should be allowed to flow in and out, and, if possible, twice a day. This should be kept up for ten days, and then the patient should take injections himself for ten days longer.

Protargol is a safe injection for the patient to use himself. A half-per-cent solution is considered strong enough at first, and should be diluted if there is much scalding. The injection should be retained for at least three minutes, but ten minutes is better. Repeat three times daily for ten days, and then at longer intervals until a cure is effected.

With all three of the methods it is often necessary to give a mild astringent injection at the end to get rid of the final glueing together of the lips of the meatus in the morning. Balch uses sulphate of zinc from 4 to 8 grains, fluid extract of hydrastis ½ ounce, and rose water up to 4 ounces. Strong solutions of silver nitrate applied through an endoscope, or strong solutions of permanganate or corrosive sublimate by injection, which rarely cut a gonorrhea short, are justifiable only under extraordinary circumstances.

It is safest to rely on medicine only if the disease is presented after developing

fully for several days. If it does not upset his digestion the patient should drink two quarts of water daily instead of taking citrate and acetate of potash. Compound salol capsules are found better than sandal oil. Methylene blue is best given in capsules containing one grain of methylene blue, one drop of oil of cassia, and one drop of oil of sandalwood. Three capsules a day is usually as much as a patient can take, and at times the dose has to be reduced to two after forty-eight hours. Urotropin when given in large doses causes scalding. Salol is in the same class as urotropin, but is not as efficient as a urinary antiseptic; it also causes scalding.

Peppery and spiced foods should be avoided. Neither ginger ale nor alcohol should be used.

The patient should keep as quiet as possible, should avoid bicycle and horseback riding, should keep the bowels open, and should avoid sexual excitement. A hot bath on going to bed lessens the tendency to chordee. A suspensory bandage lessens the liability to epididymitis. In inflammation, rest in bed and an ice-bag give the greatest relief. A narrow meatus should be cut at the beginning to enable injections to be given satisfactorily.

Obstinate cases clear up surprisingly when all treatment is stopped. A false sense of security is given by an astringent injection in the early stages of the gonorrhea.

THE RADICAL TREATMENT OF MALIGNANT DISEASE OF THE LARYNX.

WAGGETT *(New York Medical Journal,* March 9, 1901) points out that in the radical treatment of disease of the larynx there is a new thyreotomy and a new statistics—a statistics which is overwhelmingly more favorable than that of any other radical operation for malignant disease of the larynx. By it is obtained a percentage of 29.9 of three-year cures, as against 5.85 per cent after total extirpation, according to Sendziak's statistical tables, including all available cases between 1851 and 1894.

The comfort and ability of the successful thyreotomy case is almost complete. There is, of course, no fistula, and no tracheal tube. The voice must always be the last consideration in the matter, but Semon, well recognizing this fact, records the vocal results in ten of his successful cases thus: voice good, 6; weak, but better than before operation, 2; whisper, 2.

Semon's death-rate from operation for the period 1888-1897, including the early cases which served to invite rather than to exemplify a final and improved form of operation, amounts to 6.66 per cent. Out of the fifteen patients, one died from the operation; the patient was a chronic bronchitic, seventy-two years of age.

As to a reasonable assurance of a permanent lease of life after thyreotomy, Semon computes his percentage of cures (*i. e.*, more than one year free from recurrence) as 83.3 per cent, or ten out of twelve operations.

Waggett believes that, in the face of these figures, it is absurd to sweep aside thyreotomy with the remark that it is an operation which half a century ago was discredited and abandoned. Thyreotomy, he believes, as practiced by Semon, Butlin, and a large number of other British surgeons, yields brilliant results. As to Professor Mackenzie's new operation, he contends that the results of experience with it must be awaited.

Waggett holds that an operation which has yet to win confidence, and which at best can offer the patient an insecure lease on life, purchased at a terribly heavy premium, should not be used as a means to repress thyreotomy, which is now doing admirable work.

POINTS IN THE CLASSIFICATION AND DIAGNOSIS OF SOME JOINT AFFECTIONS.

BANNATYNE *(Lancet,* Feb. 23, 1901) summarizes present knowledge of the great variety of ways in which arthritic troubles may arise. There are those due to (1) bacteria themselves acting on the joint structures; (2) bacterial poisons (pulmonary osteoarthropathy); (3) toxic poisons of an as yet undetermined character (gout); (4) nerve degenerations; and (5) senile degenerations. Of these Nos. 2 and 3 will probably be referred to some other category as further scientific data become available.

TREATMENT OF CHRONIC GONORRHEA.

ALLEN *(Boston Medical and Surgical Journal,* Feb. 7, 1901) terms gonorrhea chronic when the inflammation has become

localized at one or more points along the course of the urethra. Gleet is slight, and the urine is transparent, but contains shreds of mucus and pus. The points at which the subsiding inflammation most commonly lingers are the penoscrotal angle and that portion of the pendulous urethra just anterior to it, the bulbomembranous junction, the prostatic urethra, and much less frequently the fossa navicularis.

The tissue changes following an acute gonorrhea, which determine the localization of the disease at these points, have an important bearing on treatment. In the treatment of the conditions the objects to be aimed at are the removal of fibrous deposits, the restoration of the thickened and rigid mucous membrane to approximately its original soft and elastic condition, and the cleaning out of diseased follicles and glands.

The first principle of the treatment is dilatation—dilatation of the anterior urethra to check the cicatricial contraction, cause the absorption of the morbid deposit, and open up the follicles so that medicated solutions can penetrate them, and dilatation of the posterior urethra to open the follicles of the prostate in the same manner, and to stimulate circulation in the passively congested mucous membrane.

Ordinary dilatation with sounds is often unsatisfactory, because it cannot be carried far enough. By means of dilators which can be passed through a moderate-sized meatus, the urethra can be stretched to a point far beyond what is possible with the largest sounds and yet cause little or no reaction.

For stretching the urethra the four-branched dilators of Kollman are the best. A straight instrument is used for the anterior urethra and a curved one for the posterior. There is little pain or reaction in some cases where it is necessary to dilate to an extreme degree. Ordinarily, dilatation stops several sizes short of 40.

After dilatation the local application of various remedies is effected by means of injections or irrigations, and later the urethra is inspected through the endoscope and local applications made under control of the eye to such points as require them.

If the patient, in an average case of anterior urethritis, objects strongly to meatotomy, dilatation may be fairly well done with an Otis urethrotome without the knife. First, an endoscopic examination may be made to aid diagnosis. With a bulbous bougie any narrowing, if of sufficient degree, can be detected and located. Should there be little narrowing of the urethral caliber, the instrument can be screwed up easily to a high point without pain. The urethra should be washed out with a suitable preparation; Allen generally injects about half a drachm of ten-per-cent solution of protargol, rubbing it in thoroughly from the outside. For the first few days after dilatation, while the follicles are still wide open, the patient should use an injection of bichloride, silver nitrate, or permanganate twice a day. The treatment should be repeated in a week, or the endoscope used, according to circumstances. In case of stricture this must be gradually dilated at weekly intervals until practically done away with before the endoscope will be of much use. For local applications through the endoscope, nitrate of silver in solutions of from three to ten per cent gives the best results.

In the deep bulbous and prostatic portions the curved dilator is used. When the follicles of the prostate are involved massage is of great assistance. The appearance of the urine is carefully noted, as it furnishes the best guide to the progress of the treatment. The prostate is massaged by the finger in the rectum while the bladder contains some urine. The patient then urinates, entirely emptying the bladder. The fluid is carefully inspected for the short clump shreds that come from the follicles of the prostate. The posterior dilator is passed and screwed up slowly as far as the patient can bear without discomfort, left in a few minutes, removed, and an injection of permanganate, silver nitrate, or protargol thrown in. This may be repeated once a week.

When the seminal vesicles are involved, stripping or massage of these organs is done in connection with the treatment just described. Sometimes a chronic discharge proceeds from the vesicles alone. In this case treatment is confined to them, and stripping is all that is required.

WHEN IS A GONORRHEA CURED?

THORNDIKE *(Boston Medical and Surgical Journal*, Feb. 7, 1901) admits that the question when is a gonorrhea cured cannot be answered. It will probably never be known, he thinks, when a man whose

urethra has become infected with a gonorrheal inflammation ceases to be a dangerous person to those with whom he may have sexual relations. Many patients recover, but there are many others who do not. Some of these latter, believing themselves well, certainly do infect their wives. Noeggerath stated, in 1872, that ninety per cent of men infected with gonorrhea infected their wives, and that men infected with gonorrhea never recovered.

The discovery of the gonococcus since that time does not seem to have markedly changed the force of his conclusions.

Physicians, in the face of these facts, are advised to use every effort to prevent the exposure of innocent women to this infection, and to teach the rest of the world the necessity for being similarly careful. Most men have probably had a gonorrhea some time in their lives; all these certainly cannot be forbidden to marry. Where possible an examination should be made to determine if it would be safe for them to marry.

The author's personal belief concerning examination is summarized as follows:

The methods of examination now known are fairly adequate to determine in any case whether there are still contagious possibilities in the case.

Present-day methods of treatment are fairly adequate for the treatment of those cases where remnants of the disease are found. Such remnants of disease should be treated whether they contain gonococci or not. They can only be intelligently treated, however, after they are found and located.

There are a few cases where the remnant of discharge persists but where no cause for the persistence can be found. Some of these must probably be allowed to marry with traces of discharge still discoverable; but none such should marry until every possible effort has been made to demonstrate its non-contagious character and until the possibility of future trouble has been explained. It is the author's custom to have more than one opinion in a case of this kind.

PRIMARY AMENORRHEA.

GILES *(Medical Press,* Jan. 30, 1901) observes that delayed menstruation is primary amenorrhea in a patient of eighteen to twenty-five, whose pelvic organs are normal or only slightly under-developed; and that permanent amenorrhea is primary amenorrhea in a patient who is over twenty-five or whose pelvic organs are markedly undeveloped.

On the point of the likelihood of menstruation coming on, good prognosis can be given in the case of a girl of sixteen or seventeen; at eighteen or nineteen it must be more guarded, and the effect of treatment should be watched; after the age of twenty no opinion should be expressed without making an examination.

If the patient be suffering from anemia, tuberculosis, or other constitutional condition that may cause amenorrhea, it may be said, subject to the age conditions treated above, that menstruation will probably begin when the general condition has improved.

If the general condition be good, and the patient be twenty years of age or older, the development of breasts and pubic hair should be noted. Any marked deficiency in these secondary sexual characters is unfavorable, but an examination should be made. The patient, if unmarried, can best be examined under an anesthetic. If no abnormality can be found, or the uterus is only slightly under normal size, the prognosis is not unfavorable; if the uterus is very small or rudimentary, or if the ovaries are very small and infantile in shape, the probability is against the establishment of menstruation.

The question of child-bearing will only arise in patients eighteen or over. An examination of the pelvic organs will be required. If they are normal the prognosis may be considered fairly good if the patient be eighteen; if she be nineteen and has not menstruated, she is more likely to be relatively, though not absolutely, infertile. If she is twenty or over the likelihood of child-bearing diminishes rapidly in proportion to the age; and if she be twenty-five or over, she will almost certainly be sterile.

If the uterus is under-developed, the uterine canal measuring two inches or less, the patient will be sterile even though she may menstruate.

Faulty constitutional condition should be treated. Anemia especially requires iron with arsenic and strychnine or nux vomica, and as the anemia improves menstruation is more likely to be established. Reputed emmenagogues have not been found by Giles to be encouraging. After a reason-

able trial of drugs, if no result is obtained, it is usually advisable to examine the pelvic organs. If there is under-development, drugs are futile, and under these circumstances it is best to explain the condition and leave matters alone. Electrical stimulation is undesirable and unnecessary in the case of single patients, though it may be tried in exceptional cases. The most effective stimulus is that supplied by marriage, but Giles does not believe it comes within his province to advise matrimony as a remedy for amenorrhea.

PERITONSILLAR ABSCESS.

COBB *(Boston Medical and Surgical Journal,* Jan. 31, 1901) urges more care and study in the relief of peritonsillar abscess. The cause of this affection is said by some authorities to be due to suppuration in the loose connective tissue around the tonsils which starts *de novo,* as does any boil elsewhere. Others say that it is a symptom of the rheumatic diathesis, while still others think, as does the author, that it results from infection by the germs of acute tonsillitis. It is always met with in conjunction with some tonsillar obstruction to the supratonsillar fossa. The consensus of opinion seems to be that it arises in the cellular tissue above, behind, or in front of the tonsil. Chiari, however, believes that the abscess is formed in the pharyngomaxillary space. Injection of this space in a cadaver certainly gives the appearance of the ordinary peritonsillar abscess. This space also contains the great vessels, but is separated into two portions, an anterior and a posterior, by the stylopharyngeus muscle and its fascia. In the former Chiari thinks that the pus forms, and being unable to force its way backward on account of the resisting stylopharyngeus, pushes forward and inward until it makes its exit through the pillars usually in front of or behind the tonsil.

Diagnosis is usually easy after the first forty-eight hours, the familiar swelling of the soft palate and its one-sided appearance making a picture not easy to mistake. Pain, of short duration, and violent inflammatory appearances are strong characteristics. The cases which require most care in diagnosis are those in which the swelling has lasted some weeks without much inflammation or pain. The diagnosis between sarcoma of the peritonsillar tissue, syphilis, and subacute peritonsillar abscess is sometimes difficult. Peritonsillar inflammation is not accompanied by ulceration in any part of the mouth or tonsil, while gummata or sarcomata are apt to be so associated. In chronic peritonsillar swelling, some discharge of pus may usually be found on careful examination, while puncture, if other means fail, will give a clue to the diagnosis.

The first symptom is usually a severe chill followed by fever and headache, and by pain referred to one side of the throat only. The pain throbs at first, but becomes sharper. Ear pain is prominent. Interference with respiration in adults is not usually so marked as in children, but deglutition is very painful. In bilateral peritonsillar abscess the ordinary appearance is of course changed, as well as the symptoms of pain and throbbing on one side. The evenly swollen palate presents no contrast; the uvula hangs in the middle line. When the tonsils are carefully examined no enlargement is shown beyond the pillars, and the pillars are nearer the median line of the pharynx than usual. The bilateral condition is a rare one in the author's experience.

Cases of untreated peritonsillar abscesses usually subside through rupture commonly occurring between the pillars of the fauces. Their duration is about seven days. Cobb notes that if an attack cannot be aborted in less time than is required by nature nothing is gained by operation. The disease is usually self-limited, but there are several cases on record where the pus made its way into the posterior part of the pharyngomaxillary fossa, and so into the mediastinum, with a fatal result. Thrombosis of the large veins and pyemia have also resulted.

Cobb has found it impossible to abort an attack after peritonsillar swelling has appeared. When the patient feels an attack coming, resort may be had to quinine, opium, and diaphoresis, on the same principle as is adopted to check a cold. Bosworth believes in the salicylates and other antirheumatic remedies, and gives large doses of 13 to 15 grains an hour of the salicylate of soda with a drop of Fleming's tincture of aconite until the physiological effects of numbness and tingling of the finger-tips caused by the latter drug begin to appear, when its use is permanently discontinued. Knox found this procedure efficacious in forty out of fifty cases. Cobb, after trying the salicylates, believes that

where swelling of the peritonsillar tissue exists only the knife can give any relief, while the salicylates on account of their depressing influence contribute to the exhaustion which follows this very debilitating disease. When the swelling increases, efforts should be directed to bringing the abscess to a head as quickly as possible. Hot-water gargles repeated every hour are found as satisfactory as anything for this purpose. It is after the swelling is well under way, or three or four days following the onset of the disease, that the best work may be done in checking the abscess. At this time the surgeon often lances the anterior pillar without obtaining pus, and even when he is so fortunate as to find it the wound closes at once and the symptoms recur within a few hours with the same severity as before. In general it may be said that a deep puncture through the anterior pillar seldom remains open, while a shallow one not infrequently does remain open.

If swelling of the posterior pillar behind the crypts of the tonsil is present, it should be probed to make sure whether it fluctuates or is simply swollen and edematous. If fluctuation can be obtained, a puncture, practically painless with the application of cocaine, should be made; a cure results with very little discomfort to the patient. If the posterior pillar appears normal, there may be a slight bulging at the junction of the anterior with the tonsils, and a very little dissection under cocaine in order to separate tonsil and pillar will give pus, which with a good-sized opening will discharge continuously. If there are no signs of pus in either pillar, the supratonsillar fossa must be sought as the most probable seat of the suppuration.

Here the knife must be used with care, as cases of death are on record from injury to the great vessels which lie in the pharyngomaxillary space. If penetration of the posterior pillar after traversing the abscess be avoided there is no danger of injuring the great vessels. The tonsillar arteries enter at the base of this organ, and may be avoided by passing between the tonsil and the pillar. If pus is not found in either anterior or posterior pillar the supratonsillar fossa should be entered, care being taken not to penetrate back further than the posterior pillar. If pus is obtained a wider opening through the tonsil may be secured. Cocaine should be employed, submucously or otherwise, to make the procedure as painless as possible.

PERIGASTRIC ADHESIONS.

BIRD (*Intercolonial Medical Journal of Australasia*, Dec. 20, 1900) points out that the subject of perigastric adhesions is complex in its anatomy, its causation, and in its results; and that it is only of late that more than an incidental interest has been taken in these adhesions. Now it is seen that perigastric and neighboring adhesions merit a special consideration quite apart from the diseases which give them birth.

The slighter forms of the adhesions are said to occur in five per cent of all necropsies. They vary in density, texture, size, and shape. Though due to a variety of causes, they are of syphilitic origin in some cases. They tend to disappear in many instances. They may produce no symptoms, or give rise to grave symptoms.

They are apt to be overlooked, and even during an exploratory operation their presence may not be detected unless the operator specifically looks for them. They lend themselves to properly directed operative treatment without danger. The dragging caused by them may be associated with a neurotic element, sometimes markedly. Sometimes they may be the causes of many so-called neuroses. In any case when they produce symptoms their clinical results are very disproportionate to their pathological entity.

The slighter adhesions may be classified by their causation thus: (1) Those induced by gastric and duodenal ulcers; (2) those whose infection arises from the bile-duct; (3) those due to syphilis; (4) those of uncertain origin; (5) some cases undoubtedly traumatic in origin.

By their symptoms they may be arranged into those which cause pain, and those which constrict natural passages.

Of such cases Bird has operated on about twenty. Most of these have been absolutely cured, and the remaining few have been very much improved.

The main characteristic is epigastric pain, started or increased by any kind of food. Adhesion pain anywhere in the abdomen is definitely localized: the patient can put his finger right over the spot where operation subsequently proves the lesion to be. This epigastric pain, bearing more or less definite relation to gastrolocomotion, and the earli-

est symptom, is different, as a symptom, from that of malignant disease of the stomach, of which pain is not at all a marked symptom until late in the disease, and in most cases not until a palpable tumor has formed.

The remission of pain when the patient is recumbent after a meal is decidedly suggestive of perigastric adhesions if there is pain when moving about with food in the stomach.

Vomiting is not believed to be a prominent symptom. When it does occur it shows signs of gastric digestion which has not been delayed.

The presence of jaundice is an accident. It should, however, be looked for; its existence is some help in forming a possible diagnosis.

The futility of medicinal and dietetic treatment is of great value, not only as a means of diagnosis, but also as an indication of the necessity of operative measures. All things, whether it be the persistent local pain, the disability of the patient, the loss of general health, strength, and weight, or the inefficacy of the physician's treatment, point toward an exploratory celiotomy.

The length of time that dyspeptic symptoms have lasted is no justification in itself for surgical intervention. It is the uselessness of medication and hygiene in a case of chronic indigestion, of which epigastric pain is the chief symptom, which renders justifiable a recourse to surgery, and careful consideration shows that these adhesion cases are in reality more definite in their symptoms than are cases of gastric carcinoma in any but the last stages.

Several considerations tend to encourage the surgeon in his exploration of the upper abdomen. Ventral hernia seldom occurs with an incision of moderate length and careful suturing. The stomach does not resent manipulation, and a nearly median incision above the umbilicus allows the surgeon to obtain a fair knowledge of the condition of the gall-bladder, pylorus and upper duodenum, pancreas, and portal fissure, in which places are centered the foci of pathological interest in the upper abdomen.

In incising the interval between the tip of the ensiform cartilage and the navel, the surgeon should be regulated rather by the position of the umbilicus or by the level of the ninth rib than by the size of the ensiform cartilage. An incision of very moderate length suffices; one of two or two and a half inches will permit delivery of the stomach. The line of incision should be to the left of the middle line to avoid the aggregation of fat about the round ligament. Much care should be exercised where the costal borders are prominent and the abdomen emaciated, and more particularly where the respiratory acts are at all violent.

The tour of discovery with the finger begins at the gall-bladder. After obtaining general information an attempt should be made to deliver the stomach; this is easy in some cases and impossible in others. Delivery allows of thorough inspection of the stomach and the easy division of any adhesions. Where it is impossible to make delivery, the attempt to do so, by stretching the wiry adhesions, demonstrates the position of the adhesions and may result in their destruction.

Many of the adhesions in the lesser omentum can be grubbed through with the forefinger-nail; care should be taken, however, not to injure several important arteries in this vicinity. Considerable hemorrhage may appear when a patient with good intra-abdominal pressure strains much; blood will be forced from all parts of the operative area to the small opening, there to look almost like important hemorrhage. Sponge pressure will in a short time leave the field dry. Careful attention should be paid to the vicinity of the pylorus; proper inspection cannot be accomplished unless the anterior layers of the great omentum are torn through and the posterior surface of the stomach is exposed to view. A process of invagination effected by the left forefinger pressing the stomach down from above into the rent in the great omentum allows of the most searching examination of the posterior surface of the stomach and pylorus. Gaining the lesser peritoneal cavity may sometimes be difficult owing to the presence of fat and of veil-like adventitious layers; large veins must be left uninjured. The finger, and sometimes the scissors, but never the knife, should be used in disposing of the adhesions. A thin catgut ligature is only occasionally necessary.

By observing the enlargement of the circumferential gastric lymphatic glands, and also those in the higher parts of the gastrohepatic omentum, the operator may gain hints of the presence of carcinomatous or syphilitic diseases.

The placement of the stomach and closure of the abdominal wall (the great omentum

will take care of itself) are now all that is required to complete an operation which, harmless in itself, will cure nearly all, and greatly relieve other cases of epigastric distress due to the slighter forms of perigastric adhesions.

INTERSCAPULOTHORACIC AMPUTATION FOR SARCOMA OF THE SHOULDER.

PAGE *(Lancet,* Feb. 23, 1901) describes in detail two cases of interscapulothoracic amputation for sarcoma of the shoulder.

The two cases were somewhat similar in character. One of the patients was a man aged forty years, admitted to the hospital with a soft fluctuant swelling of the size of a small orange over the outer end of the spine of the right scapula. His physician had diagnosed the affection as inflamed bursal cyst connected with the joint. It was held to be an ominous fact, however, that the edge of the scapular spine was at one point deficient as if from erosive destruction. An examination after the tumor had been opened revealed a round-cell sarcoma. Operation was at last agreed to by the patient, and the whole upper extremity was removed by the method of Paul Berger. The wound healed by first intention, and there was no suspicion that any growth had been left behind. About two weeks afterward the wound was again opened, nodules having appeared, and one lymphatic gland was removed, together with some more of the cervical fascia, and a further portion of the trapezius muscle. He had a pain in the right hip which gradually grew worse. Later there could be no doubt what it was, but surgical intervention was impossible. Two nodules were also found at the site of the operation. It was heard of him that his leg broke, that further recurrences took place at the right shoulder and affected both his head and his side lower down. He died after great suffering.

The second patient was a country girl aged nineteen years, admitted with a tumor on the right shoulder. Over the apex of the shoulder, occupying the region of the supraspinatus muscle, was a distinct tumor the size of a large hen's egg, giving a sense of deep-seated fluctuation, and a feeling much like a distended bursa. Operation was performed for exploration, a drainage-tube was inserted, and two days afterward when the dressings were changed it was seen that there had been septic invasion. Another examination revealed mixed-cell sarcoma. It developed by leaps and bounds, day by day the gelatinous material protruding in larger volume from the wound. The whole upper extremity was removed by an operation exactly like that in the first case. Later there was removed a tiny nodule of growth, together with much thickened fascial structures from the divided edge of the trapezius. The whole upper part of the wound area was freely scraped to impart to it a healthier tone. About eight months afterward there were signs of recurrence, a fluctuant subcutaneous lump the size of a Tangerine orange being found over the left side of the spine at the level of the second, third, and fourth dorsal vertebræ. The tumor on the back was freely removed, and found to consist of soft sarcomatous structure and one large cyst. The patient on February 19 was on the road to recovery.

Page remarks that the first cases exemplified in a remarkable degree some of the peculiarities of sarcoma—its insidious origin, its early quietude and slow rate of growth, its sudden outburst of extreme malignancy, and the difficulty of its diagnosis. More deceptive indications could not have been found than the duration of the swelling and the strange simulation of an abscess. The surgical interference seemed to determine a fresh malignancy of singular violence. Page thinks that it might have been better if the patient had not been subjected to an operation. Wide dissemination of sarcoma soon followed the major operation, and as general tuberculosis is known to follow operations on local tuberculous diseases, it may be that the spread of sarcoma is likewise determined.

The second case was clearly the less malignant of the two, and no evidence exists that operation was answerable for spread of the disease even though the wound was septic. In this case it seems justifiable to assume that removal of the extremity secured both freedom from suffering and prolonged life.

Serious shock was not pronounced in either case, attributable in a large degree to preliminary ligation of the subclavian artery and the avoidance of blood loss.

TREATMENT OF CANCER.

LAUNOIS *(La Semaine Médicale,* 21 an., No. 9) reports excellent results in the treatment of incurable cancer under the influ-

ence of repeated hypodermic injections of hydrosulphate of quinine.

Tuffier noted a marked improvement in a huge malignant ulcer incident to hypodermic injections of cacodylate of soda.

Quenu laments the fact that both quinine and the cacodylate of soda were absolutely inoperative in his hands, whilst the serum of Wlaiev was even prejudicial.

Berger notes that this serum sometimes produces an improvement in the local and general symptoms, but that the cancer itself never shows the least sign of getting well, nor does he believe that there lies in any of the recently proposed medicaments and treatments against cancer the slightest hope of the discovery of a cure. Nimier is in accord with this observation.

TREATMENT OF CHRONIC HYDRARTHROSIS OF THE KNEE.

DEBAISIEUX *(La Semaine Médicale,* 21 an., No. 9) has modified to some extent the treatment of hydrarthrosis which has been formulated by Schede. It will be remembered that this treatment consisted in puncturing the articular cavity, aspirating or drawing off the contained liquid, and washing out the synovia several times by means of a three-per-cent carbolic acid solution. After having injected this carbolic acid solution, it is sometimes extremely difficult to withdraw it because there is formed a coagulum by the action of the carbolic acid upon the contained fluid, which readily blocks the cannula. To prevent this the injection of carbolic acid is preceded by one of sterile physiological serum. After the joint has been thoroughly washed out with this and with the carbolic acid, a pressure bandage is applied and the member is immobilized for two weeks, after which massage and faradization are begun.

PARALLELISM OF THE LOCAL AND GENERAL LEUCOCYTOSES IN MORBID PROCESSES.

ACHARD and LOEPER *(La Semaine Médicale,* 21 an., No. 9) note from a large number of studies that there is a similarity in morbid processes of the local and general leucocytoses; that the presence of polynuclear leucocytes and medullary elements is characteristic of transitory affections, whilst the mononuclear leucocytes and the lymphocytes are characteristic of affections which cause the formation of more or less durable tissue. In pneumonia, abscess, angiocholitis, and acute peritonitis, for instance, polynuclear leucocytes are found both in the blood and in and about the inflamed area. In subacute affections, such as tuberculosis, syphilis, and leprosy, the nodules are invaded by mononuclear leucocytes, and in the blood there will be found a predominance of these elements. In cancer there is often both a local and general polynucleosis, denoting usually infection, sometimes the activity of the tumor. In chronic affections, such as sclerosis, chronic hepatitis, and renal atrophies, mononuclear leucocytes are found in considerable number in the sclerosed region.

SYPHILITIC REINFECTION.

MRACEK *(La Semaine Médicale,* 21 an., No. 9) reports the case of a patient who seven years before, having contracted a chancre, was treated subcutaneously by injections of sozoiodolate of mercury and had mouth administrations of potassium iodide. No secondary lesions ever followed, but seven years later there developed a second chancre, followed by a general skin eruption and typical glandular enlargement.

Neumann states that he has personally observed eight cases of syphilitic reinfection, and the shortest interval between the attacks was two years. He holds that the possibility of reinfection proves beyond doubt the curability of the disease.

FOREIGN BODY IN RIGHT BRONCHUS.

GAREL (*Lyon Médical,* Jan. 6, 1901) records the following case: A child, aged eighteen months, put an iron nail, 53 millimeters long, into his mouth. He at once suffered from dyspnea and became cyanosed. He was held up by the heels and shaken, but the nail was not recovered, and was thought to have been swallowed, as the patient soon became comfortable. The stools were carefully examined for two months in vain. The child was then troubled with a constant cough, and became pale and thin. Harsh breathing and râles were heard over the right lung, especially at the apex, and a physician, to whom the accident was only casually mentioned, diagnosed phthisis. By means of the Roentgen rays, however, the nail was

clearly shown in the right bronchus. It was extracted through a tracheotomy wound without difficulty by means of an electromagnet, under a tension of four volts only. The child made a good recovery. Garel believes his success to have been due in great measure to the use of the magnet rather than to the forceps. He would, he thinks, in a similar case in future attempt extraction without tracheotomy. By Kirstein's method—that is, forcibly extending the head and strongly depressing the tongue—a straight-tube speculum may be passed and illuminated by means of a small electric lamp. Thus all the larger bronchi may be directly brought into view. This method, however, is difficult in practice, carries with it a certain danger of asphyxia, and should not be attempted except in chronic cases. Without this the course of operation could be followed by Roentgen's fluorescent screen.—*British Medical Journal*, March 2, 1901.

GASTRIC HEMORRHAGE AND ITS SURGICAL TREATMENT.

Robson (*Scottish Medical and Surgical Journal*, March, 1901) urges that all cases of acute uncomplicated gastric ulcer should be submitted to thorough medical treatment in the shape of long-continued rest and attention to diet, the cases not being allowed to get up or resume solid food until at least a fortnight after all disappearance of pain.

Where the ulceration persists and proves intractable to medical treatment, or where relapses occur, gastroenterostomy should be performed, so as to secure physiological rest and relieve the hyperacidity of the gastric juice nearly always found in such cases.

Perforation demands immediate surgical treatment.

The complications of disabling adhesions around the stomach and pylorus, pyloric contraction and hour-glass contraction due to chronic ulcers leading to pain, dilatation, loss of flesh and general impairment of health, and now often treated as chronic indigestion, should be treated surgically.

In recurring or so-called chronic hematemesis from gastric ulcer, surgical treatment is decidedly called for.

In acute hematemesis, further accuracy in diagnosis as to the size of the bleeding vessels is urgently needed; and the cooperation of the physician and surgeon is advisable in all cases of hematemesis, so that if relief be not obtained by medical and general treatment, surgical means may be adopted if the bleeding is believed to occur from a large vessel; but seeing that capillary hemorrhage is capable of relief by medical means alone, medical should always precede surgical treatment.

ACUTE CELLULITIS TREATED BY ANTI-STREPTOCOCCIC SERUM.

Kelly (*Scottish Medical and Surgical Journal*, March, 1901) treated a strong man of twenty-eight who suffered from acute cellulitis by antistreptococcic serum. Before this treatment was begun incisions were made with only temporary relief.

The patient had been wounded superficially in the web between the fore and middle fingers of the right hand; a small abscess formed, and after the abscess had been squeezed the hand began to swell. The incisions made for relief producing only a temporary result, it was determined to adopt more extensive treatment.

Under chloroform, the arm and hand were freely incised and drained, and dressed with aseptic gauze.

The seropurulent discharge from the wound was examined microscopically and found to contain streptococci.

Under strict antiseptic precautions, ten cubic centimeters of antistreptococcic serum was hypodermically injected into the left side of the abdominal wall immediately after the operation. The patient became delirious, and remained so for thirty-six hours.

Next day the temperature was 100.6°, so a second dose of serum was injected into the right side of the abdomen. The dressings were removed, and the arm was soaked for two hours in a warm solution of boric acid. The swelling was much reduced, there was free discharge of thin, fetid, seropurulent fluid, and the pain was greatly lessened. The temperature rose slightly, but two days later it was 98.6°. When it rose again to over 100° a third injection was given in the left epigastric region. This was again followed by a rise of temperature to 102°, followed by a fall in the night to normal. The arm was

again soaked in warm boric solution for two hours in the morning, and for an hour at night, which treatment was continued for twelve days. The temperature gradually became lower.

On about the third day after operation, and the following three days, the drainage-tubes were removed, and the edges of the wounds approximated by catgut sutures, they having become quite free from any appearance of pus.

The patient rapidly recovered. In a few days after going into the open air he was attacked by a severe general urticaria, and at the same time a swelling in the abdominal wall was noticed to be more pronounced and distinctly fluctuating. The use of boric acid in the bath was at once stopped without effect. Various measures were tried without relief, and in about two days after examination of the swelling an incision was made in the left hypogastrium over the swelling. A large amount of pus was evacuated, the abscess was drained, and almost immediate relief from the pain of the urticaria was experienced. In a few hours the rash had disappeared, and the temperature had returned to normal.

The abdominal drainage-tube was removed on the third day, and the wound healed rapidly. The pus obtained by the evacuation was found to be teeming with streptococci, and a typical culture was obtained.

Meanwhile, the wounds of the arm and hand were healing rapidly, and the patient returned to business twenty-two days after the first injection of serum.

Kelly believes that the rapid improvement was not entirely due to the other methods employed apart from the use of antistreptococcic serum.

The occurrence of a rash so long after the injections was probably due to the serum.

Kelly is prepared to use the serum in any suitable case, after weighing impairment of function or actual loss of limb or even life against the chances of cure by treatment without the serum.

MEDIAN OSTEOTOMY OF THE HYOID BONE.

VALLAS (*Revue de Chirurgie,* May, 1900) has devised an excellent means of gaining access to the lower parts of the pharynx and the vestibule of the larynx. The operation is indicated for the removal of foreign bodies, of benign neoplasms, of epiglottic cancers, and for the treatment of syphilitic strictures. Tumors of the base of the tongue and even the whole of that organ may be removed by this method. Preliminary tracheotomy, at first thought necessary, has been given up.

Make a vertical median incision from the symphysis menti to the superior angle of the thyroid cartilage. Separate the fibers of the mylohyoid muscle in the middle line. Expose and divide the hyoid bone in its middle. Retract the two halves of the bone laterally along with the mylohyoid muscles. A space one and one-half inches wide is thus easily exposed. The lower part of the wound is only separated from the pharynx by the thyrohyoid membrane, the upper part by the buccal mucosa. If the object of the procedure is to reach the lower pharynx, cut downward through the thyrohoid membrane; if the root of the tongue is the objective, cut upward. The wound is closed by sutures. Drainage of the lower part of the wound is proper.

When excising the tongue, Vallas first ligates both lingual arteries, and through the same incisions removes the submaxillary glands. He then performs hyoid osteotomy as above described, but does not divide the thyrohyoid membrane. The submental wound is only separated from the mouth by the mucosa. An assistant opens the mouth with a suitable gag, and the surgeon, through the mouth, divides the frenum, the floor of the mouth, and the inferior and lateral connections of the tongue, including the anterior pillars of the fauces. The tongue is manipulated by a traction suture placed through it, or by vulsellum forceps. The tongue is now connected with the body by the hyoglossus muscles alone. Place the patient in a sitting posture with the head inclined forward, and proceed with the next step rapidly, for fear of asphyxia. Pull the tongue out through the submental wound until the epiglottis appears. With the finger passed over the tongue feel for and recognize the two halves of the hyoid bone. With the scissors hugging the upper margin of the hyoid, divide the insertions of the hyoglossus muscle. This completes the operation. Closure of the wound, and the rest, is accomplished on ordinary surgical principles. —*Annals of Surgery,* March, 1901.

IODIDE OF POTASSIUM TREATMENT OF HUMAN ACTINOMYCOSIS.

LIEBLEIN *(Beiträge zur Klinischen Chirurgie,* Band xxviii, Heft 1) offers a much-needed critique of the status of iodide of potassium as a curative agent in human actinomycosis. Sixty-two reported cases are analyzed, of which forty-two were healed, seven improved, two successfully treated, one without success, incomplete four, death six, the jaw being most frequently represented, and the lung and intestine in about equal number. The iodide of potassium is most efficient in jaw actinomycosis, least in the pulmonary form. Where iodide of potassium alone was relied upon, three deaths ensued; but these were too advanced to be even benefited by operative treatment.

Of greater interest are observations on the use of iodide of potassium after unsuccessful operative interference. Once death supervened, once marked improvement, and three times cure. One of the last group was twice ineffectually operated on. The necessity of operative interference after unsuccessful application of iodide treatment arose three times. In these latter instances the iodide was given for too short a time.

At this point the author passes on to the method of giving iodide of potassium. It was only found serviceable when given for several months or more. Treatment for one year or more was only called for in the severest cases.

As to the modes of action of iodide of potassium, it is pointed out that by the disintegration of the cellular infiltration, and its discharge through fistulous tracts, the expulsion of the ray fungus is effected. In support of this theory is the bacteriological observation that iodide of potassium does not inhibit the growth of the ray fungus, and coupled to this is the clinical observation that the cases with sinuses coexisting come to a more speedy termination under iodide of potassium treatment. The advent of any mixed infection retards, and even wholly prevents, beneficent action of iodide of potassium. The quantity of iodide of potassium given fluctuated between 100 and 300 grammes; one case taking, *in toto,* 4000 grammes. Recurrences were only apparent because of insufficient treatment, and disappeared wholly when properly administered. But recurrence also took place after operation, no matter how seemingly thoroughly it was done.

Limitations of iodide of potassium treatment, because of its slowness of action, exist when the disease is of an acute phlegmonous character, and when the individual is very cachectic. Here it is merely an adjuvant to surgical measures. In these respects we have analogous conditions in syphilis. Thus, while iodide of potassium is no specific, it is a remedial of no mean order antagonistic to actinomycosis, and worthy of an extended trial in proper doses for a long period in every instance. Thus, in Wölfler's clinic it is the practice to give three grammes in increasing doses three times daily. The affected area is also covered with compresses of iodide of potassium, or a tract or cavity tamponed with iodide of potassium gauze. The diminution in size of the swelling is ever slow but steady.—*Annals of Surgery,* March, 1901.

TREATMENT OF SCIATICA BY COCAINIZATION OF THE SPINAL CORD.

MANEGA *(La Semaine Médicale,* 21 an., No. 9) has published a case of hemiplegia associated with agonizing pain of the paralyzed leg which was cured, and permanently, by one subarachnoid injection of cocaine. Encouraged by the success attending this case, Pulle treated in a similar way a case of sciatic neuralgia which had failed to yield to the ordinary medicaments—0.75 cubic centimeter of a two-per-cent cocaine solution was injected. Pain disappeared at once and finally.

Reviews.

CLINICAL PATHOLOGY OF THE BLOOD. By James Ewing, A.M., M.D.
Philadelphia and New York: Lea Brothers & Co., 1901.

Ever since the announcement was made that this book was in course of preparation we have been looking forward to its publication with interest, because we believe that a modern book upon this subject is needed, and also because we knew that Dr. Ewing was capable of preparing one which would meet all the requirements both of the laboratory investigator and the clinician. It is an interesting illustration of the advances which have been made in clinical medicine that it is possible for a skilful author to write a book of 432 octavo pages dealing

entirely with the physiology and pathology of the blood. Twenty years ago this field of clinical research was almost untouched, and we were just beginning to recognize the importance of investigating the blood in many cases of disease.

An examination of Dr. Ewing's work reveals the fact that there is no padding used to make up these 432 pages, and that every particle of material which the book contains is worthy of inclusion.

The first or introductory portion of the book deals with the interpretation of analyses of the blood, and this, we think, is one of the most important portions of the volume. While the introduction of many books may be avoided with no loss, this one should be read by every one who is engaged in the active practice of medicine. The first part deals with the general physiology and pathology of the blood. In other words, Part I deals with the various chemical and technical tests which should be employed, the variations in the shapes and developments of the cells, the leucocytes, leucocytosis, and with the development of blood cells, while Part II deals with a discussion of the changes found in blood in different tests, such as chlorosis, pernicious anemia, and leukemia. Part III deals with the blood in the acute infectious diseases; Part IV with the changes in this tissue in constitutional diseases; Part V with alterations in it in diseases of the viscera; and Part VI with the changes which take place due to the presence of animal parasites.

We can cordially commend Dr. Ewing's book to our readers, be they practical clinicians or laboratory investigators; for, on the one hand, it is written in such a form as to be easily read, and possesses distinct practical bearing, and on the other hand, it is so carefully prepared, and technical methods are so well described, that it will lend itself as a most useful book to the laboratory investigator. It is not often that we wax enthusiastic over a work dealing with one subject alone, but it is our intention to keep this book constantly at hand and to refer to it daily.

A Manual of Diseases of the Nose and Throat. By C. G. Coakley, A.M., M.D. Revised and enlarged.
Philadelphia and New York: Lea Brothers & Co., 1901.

It is not many months since we favorably reviewed the first edition of this little manual, and that our good opinion of the work at that time was correct has been proved by the appreciation shown by the profession for the author's labors. He has seized upon the opportunity to revise such portions of the work as he thought needed revision, providing a new chapter upon the infections of the upper respiratory tracts in the infectious diseases, and also adding some colored plates and black and white sketches. Many books at the present time have colored plates in them which, while attractive to the eye, are not of great value for the man who is desirous of understanding exactly what he should do for the patient before him. Dr. Coakley's work, on the other hand, seems to us to contain illustrations which are distinctly useful as illustrating the text. It must be distinctly understood that this is not a complete or exhaustive work dealing with the subjects named, but a clinical manual which does not deal so much with the literature of its theme as with the practical application of important methods for the cure of maladies in this portion of the body.

A System of Physiologic Therapeutics. Edited by S. Solis Cohen, A.M., M.D. Volume I.
Philadelphia: P. Blakiston's Son & Co., 1901.

The object of this System, which is to be published, we believe, in about fifteen volumes, is to provide the practitioner of medicine with a practical exposition of the methods, other than drug-giving, useful in the treatment of the sick. In other words, it deals with remedial measures rather than drugs; and the first volume, which is to appear in two books, of which this is Book I, deals with electrotherapy and the apparatus required for the therapeutic and diagnostic use of electricity. This particular book is written by Dr. George W. Jacoby, of New York, and the balance of the volume is written by Edward Jackson, M.D., of Denver, Colorado; William Scheppegrell, M.D., of New Orleans; J. Chalmers Da Costa, M.D., of Philadelphia; Franklin M. Martin, M.D., of Chicago; and A. H. Ohmann-Dumesnil, M.D., of St. Louis. The latter half of this volume, or Book II, is now ready. Succeeding volumes are to deal with Climatology and Health Resorts, Including Mineral Springs; Prophylaxis, Personal Hygiene, Nursing and Care of the Sick; Dietotherapy; Mechanotherapy; Rest, Mental Therapeutics, Suggestion; Hydrotherapy; Thermotherapy; Phototherapy, Balneology; Pneumatotherapy and

Inhalation Methods; Serotherapy, Organotherapy; Blood-letting; Principles of Therapeutics; Indexes and a Digest. It is evident that the editor has striven to provide the profession with a most exhaustive contribution to what he calls "Physiologic Therapeutics." The first volume is necessarily not as interesting to the general practitioner as will be its successors, since it deals, as we have pointed out, solely with electrotherapy, or rather, to speak more accurately, with the various methods of developing electricity for its employment in disease. As we have already pointed out, the special application of electricity to various diseases is to follow in Book II of Volume I.

We are exceedingly glad that an American editor and publisher has undertaken the compilation of such a useful reference work. Judging by the first volume and by the ideas which are embraced in the editor's preface, it will be a most creditable contribution to medical literature, and we look forward to the publication of future volumes with much interest and pleasure, wishing the work all the success that it deserves. If the subsequent volumes deal as thoroughly and capably with the themes to which they are devoted as does Book I of Volume I, the editor will be congratulated upon having accomplished a very laudable undertaking most successfully.

DIPHTHERIA. A Study of the Bacteriology and Pathology of Two Hundred and Twenty Fatal Cases of Diphtheria. By Dr. W. T. Councilman, Dr. F. B. Mallory, and Dr. R. M. Pearce. Boston: Published by the Authors, 1901.

This is a paper-covered volume of nearly 200 pages, including the text and bibliography, to which are added no less than seventeen beautiful plates illustrating the microscopical appearances of the tissues which have been examined after removal from diphtheritic cases. The whole object of the essay is to bring together the best results of investigation, as far as it has gone, and to add to these results the original investigations which have been made by these eminent bacteriologists.

The introductory pages deal with material employed, mixed infections, and after this with the various phases of the bacteriology of diphtheria, including the various organs in which the bacteria are found. The second portion of the work deals with pathology; with the diphtheritic membrane, its distribution and character, and the changes which take place in the heart, lungs, spleen and other important organs when the patient is infected by the disease. After studying the influences of the poison of the disease upon the various organs, a summary is given of the views of the authors concerning the changes which have taken place, which adds very materially to the value of the book in the hands of the general practitioner and pathologist.

The work is a most creditable production, of which not only the investigators themselves but the whole American medical profession ought to be proud.

UTERINE FIBROMYOMATA. By E. Stanmore Bishop, F.R.C.S. Eng.
Philadelphia: P. Blakiston's Son & Co., 1901.

This book is characterized by admirable illustrations, but it is chiefly to be commended because of a very complete and satisfactory description of operative technique.

The first chapter is devoted to general considerations; then follows a brief but very satisfactory discussion of anatomical considerations. There are chapters on symptomatology, diagnosis, secondary changes, electricity, and a general survey of surgical treatment.

For the preparation of catgut the author gives preference to Pozzi's process. This consists in removing the oil with juniper, placing the gut for four hours in a sterilizing oven at 284° (probably F.) for one hour in an aqueous solution of hyd. bichlor. 1:1000, then for eight days in ol. juniper. The gut is preserved in alcohol with one-tenth part oil of juniper. Before using, it is put in aqueous sublimate solution.

As for dressings, the author states that for some time he has almost ceased to use them, preferring to seal his wounds with celloidin.

In describing the various operations, Kelly's last method of splitting the uterus, applicable to extremely difficult cases, is not mentioned.

As to postoperative treatment, the author calls attention to the fact that if celloidin has been applied after abdominal celiotomy, or, in vaginal cases, if the pelvic peritoneum has been closed, it is not necessary to keep the patient rigidly upon her back. He permits his patients to lie in any way which is most comfortable, allowing the nurse to turn them from time to time. This freedom is only made possible (1) by abandoning the drainage-tube; (2) by absolute security as to internal ligaturing of vessels;

(3) by certainty as to accurate suturing of the aponeurosis; and (4) by reproduction of the smooth, closed sac.

The dressing material is a solution of celloidin in alcohol and ether, made according to the following formula:

Celloidin, 1 part;
Abs. alcohol, 4 parts;
Ether. sulph., 4 parts.

It is applied with a brush to an absolutely dry surface. This dryness is obtained by washing the part quickly with ether. It sets in about thirty seconds.

For chloroform sickness the author administers sips of hot tea, places mustard to the epigastrium, and gives three-minim doses of ten-per-cent solution of cocaine, repeated every half-hour. He states that ice is poisonous and should never be used. Within twelve hours after operation he gives three grains of calomel combined with an equal quantity of Dover's powder, and just enough hot tea to wash it down. This is repeated in one or two hours as may be necessary. If there has been any suspicion of soiling of the peritoneum by discharges, he does not hesitate to give three doses, one every hour.

The author contributes a valuable chapter upon the after-effects of operation.

Correspondence.

LONDON LETTER.

By Raymond Crawfurd, M.A., M.D. Oxon., F.R.C.P. Lond.

Nasal tuberculosis can hardly claim to have established a place for itself in the category of disease as more than a pathological curiosity. Dr. Knowles Renshaw in a recent thesis has sought to bring the condition out of its obscurity. The total number of published cases of nasal tuberculosis is 116, and about thirty of these are undoubtedly primary. In the primary cases the lesion is almost invariably polypoid, whereas in the secondary cases ulceration is the more common form of the disease. Herzog has suggested that the nature of the lesion depends on the number of bacilli entering the nose. In cases of phthisis, for instance, where they are numerous, the tissues are severely affected and ulceration ensues, while with a lesser irritation from fewer bacilli, granulation tissue is formed and a polypoid lesion results. In this country the affection has rarely been noted even as a curiosity, but probably if searched for it would explain many obscure diseases of the nasal passages, and being for the most part situated in readily accessible parts of the nose, should be amenable to treatment.

The questions that suggest themselves have some or all been investigated experimentally by Dr. Renshaw. He has shown that it is possible to infect the nasal mucous membrane, in a susceptible animal, by simply introducing sputum containing the bacilli in a virulent condition, without producing artificially any abrasion of the mucous membrane. The sputum used was derived from phthisical patients, and the presence of bacilli was determined by the microscope; it was introduced either by means of a brush or through a cannula into different parts of the nasal passages. All the guinea-pigs experimented on showed definite signs of local irritation. It must, however, be borne in mind that guinea-pigs possess a higher susceptibility to tuberculosis than man, else nasal tuberculosis would needs be exceedingly common in man. Renshaw thinks that the constant flow of mucus from the nasal mucosa is an important protective agent. Infection having occurred, the disease in the animals infected tended to a chronic course. In no case was any difference observed between infected and healthy animals for the first fortnight, and in only one case was any enlargement of the cervical glands observed before the twenty-eighth day. In some cases the peribronchial glands and thoracic or abdominal viscera became infected about the end of the sixth week, but when the infection was confined to the anterior parts of the nostril, at a much later period. Presumably then the further from the entrance of the nostril the disease is situated, the more rapid is the generalization of the disease.

It would seem likely that a tuberculous lesion in the nostril might lead to infection of other organs by three main routes: through the cribriform plate to the meninges; with the air-current to the larynx and trachea, and thence to the lungs; and by the lymphatics of the part to the glands, and so into the general lymph-stream. In Renshaw's experiments there was absolutely no evidence of infection of the meninges, in spite of the fact that in several instances there was extensive ulceration of the mucous membrane and necrosis of the bones

surrounding the superior fossa. There was just as little evidence of infection by the air-current, for in all cases the large respiratory channels were free from disease, and when the lungs were infected there was strong evidence to show that this was brought about through the lymphatics, simultaneously with infection of other organs. It should be borne in mind that air entering by the nostrils was compelled to traverse active and extensive tuberculous disease on its way to the lungs, so that the natural provision for disinfection must be one of great perfection. In every instance the lymphatics were the track by which other organs were invaded. The first sign of this was enlargement of the superficial cervical glands about the fourth or fifth week, followed a week or two later by enlargement of the deep cervical glands; from these the infection spread to the peribronchial and retrohepatic glands, and thence to other organs. Dr. Renshaw suggests that some of the cases of strumous glands of the neck in human patients, in which no obvious primary seat can be found, may be due to nasal tuberculosis.

Dr. Ritchie contributes some important observations on the bacteriology of bronchitis to the current number of the *Journal of Pathology*. The main points may be thus summarized:

1. Acute bronchitis is an infective disease.

2. It is not due to any specific microorganism; various bacteria are found in the bronchitic secretion.

3. Some of these bacteria are exciting causes of the bronchitis.

4. The disease is more often due to mixed infection than to the action of one form of bacterium alone.

5. The most important causal bacteria are diplococcus pneumoniæ and streptococci.

6. The influenza bacillus not infrequently causes bronchitis, apart from epidemic influenza.

Lack at a recent meeting of the Laryngological Society reviewed the basis of the rational treatment of nasal polypus. He contends that a polypus is simply a localized patch of edematous mucous membrane, and that this edema is a result of disease of the underlying bone. The histological evidence of this view is strong: a polypus consists of loose fibrous tissue, the meshes of which are filled by serous fluid; it is covered by the normal epithelium, and contains vessels and glands; obstruction of the ducts of the glands by the pressure of inflammatory exudates may lead to cystic distention; the presence of inflammation is evidenced by thickening of the vessel walls and round cell infiltration, especially about the vessels and glands. Such a condition is quite distinct from granulation tissue. Clinically there is every stage between edema of the mucous membrane and a polypus—a slight edema, a marked localized edema, a broadly sessile polypus, and a typical pedunculated polypus. It is purely a question of degree and a matter of nomenclature, as the microscopical structure of each is identical. Lack holds that this edema is unquestionably due to disease of the underlying bone; in some thirty cases examined by himself the underlying bone was in a state of rarefying osteitis. The process seemed to begin as a proliferation of the cells in the deeper layer of the periosteum. Large osteoclasts in considerable numbers erode the surface of the bone; at the same time enlargement of the bone cells themselves gives the bone a more cellular appearance. By this process of rarefying osteitis the bone becomes slowly disintegrated, and the fragments, surrounded on all sides by osteoclasts, are slowly eaten away and absorbed. Clinically, by digital examination under general anesthesia, loose spicules of bone may be felt in the soft jelly-like tissue, and in some cases the probe may determine the presence of bare bone. Sometimes in severe and neglected cases of polypus, if the polypi are removed with the snare without touching the bone in any way, it may sometimes be seen that the entire middle turbinate bone has disappeared, and its place has been filled up by masses of small polypoid-looking growths. These facts serve to explain the liability to recurrence after simple removal, and the absence of recurrence when the diseased bone is completely removed. The polypoid character of the edema may be assigned to the dependent position of the growths and the action of gravity. Also that growth takes place only from the ethmoidal region of the nose where the bone is covered by a thin muco-periosteum, and that they are more common on the middle turbinate and about the regions of the ostia of the accessory sinuses where the mucous membrane is excessively lax.

Treatment should be based on a full rec-

ognition of the essential morbid histology. In cases in which no sign of active disease is still present, and the initial bone disease has passed off, simple removal with the snare will suffice. In simple cases of early bone disease, in which there is enlargement of the anterior end of the middle turbinate, with overlying edema of the mucous membrane, the disease should be removed by amputation of the anterior end or more of the middle turbinate. In cases in which only a few polypi are present, and in which there is a very limited area of bone disease, the snare may be used, taking care to encircle the piece of bone from which it grows. Subsequently all diseased bone and mucous membrane should be clipped away by Grünwald's forceps. In the cases of extensive bone disease in which there are many polypi involving an extensive part of the ethmoid, it is best to give the patient a general anesthetic and remove not only the polypi, but the whole of the affected part of the ethmoid bone. Lack describes his operative procedure as follows: "The patient being anesthetized, the ethmoidal region is thoroughly examined by the finger, both through the nose and also through the postnasal space, to determine as far as possible the extent of the disease. If the middle turbinate be present it may be removed by means of the spokeshave, and any large polypi should be removed by means of the forceps. Then the lateral mass of the ethmoid should be thoroughly scraped away by means of a large ring-knife, such as Meyer's original adenoid curette. This is the only effective instrument; sharp spoons are quite useless. In this way large masses of polypi, degenerated mucous membrane, and fragments of bone are removed. The finger is introduced from time to time to observe the progress, to feel for any spicules of bone and soft patches, and the scraping is continued until all friable tissue has been removed. Healthy parts of the ethmoid are easily distinguished by the finger and even by the curette, as they are smooth, firm, resistant, and give little hold to the knife. In some cases the operation is completed by a smaller ring-knife, but this must be employed with the greatest care. Of course, great caution must be used when it is felt that the region of the cribriform plate is being reached, but the whole inner wall of the orbit may be scraped away with impunity. The operation should be performed with the patient turned well over on to his side, and in cases where the posterior part of the ethmoid is unaffected, a large sponge may be pushed up into the postnasal space. Directly the operation is over, hemorrhage is arrested by packing the nose with a strip of gauze soaked in glycerin-iodoform emulsion, and a piece of lint soaked in evaporating lotion is then applied to the face. This gauze packing should be changed every second or third day, and the nose irrigated. If it is easily tolerated it may be continued for a fortnight; in other cases it should be omitted earlier." Granulations may spring up in the field of operation, but these usually disappear spontaneously in a few weeks. After five to eight weeks a large dry cavity, lined by healthy adherent mucous membrane, will be seen in the upper part of the nose.

PARIS LETTER.

By R. H. Turner, M.D. (Paris).

It has been often said that Frenchmen rarely leave their native land, and one must admit that French physicians do not travel much outside of their own country. As for visiting America, such a journey would seem to most of them so tremendous an undertaking that it is not to be wondered at that so few cross the ocean. This state of things is beginning to change, however, and an excursion undertaken recently by a number of physicians to foreign universities tends to show that French doctors are being awakened to the fact that there is a good deal they should inquire into outside their own country. This excursion was planned by Dr. Jayle, the assistant of Professor Pozzi, and was quite a success. The excursionists visited Lille, then Liege in Belgium, where they were most hospitably received by the professors of the faculty, Drs. Fraipont, Malvoz, and Winiwarter, who gave them a dinner, at which Dr. Vanclair was present. Several of the clinics were shown them, and one especially, the ophthalmological clinic, seemed to be most admirably arranged. There are special rooms for ophthalmoscopy, ophthalmometry, a special laboratory of histology and bacteriology. Embryology, which is under the direction of the celebrated van Beneden, is well studied, a whole semester being set apart for following the courses.

The next place visited was Cologne, where the Burger Hospital was inspected. The most important part is the service of Professor Bardenheuer, which contains 700 beds. One noticeable fact is the great number of cases of surgical tuberculosis, and also the extreme care that is taken of fractures. Quite a number of complicated apparatus were shown the visitors.

Bonn was the first German university on the programme, and it is in this town that the Crown Prince of Germany is at present studying. This place gave an impression of calm student life. The Institute of Pathology is the most noticeable feature, it being under the direction of Professor Köster. As for the Institute of Anatomy, which is supervised by Professor Schiefferdecker, it is far less worthy of notice. The dissecting tables are small and badly put together, and serve alternately for dissection and histology. The clinics are situated in quite a different part of the town. In the maternity, which is under the control of Dr. Fritsch, there are three classes of patients: the first class pay 8 marks a day, and are lodged in rooms containing only one bed; then there are rooms containing two beds, where one pays only 5 marks 30 pfennigs a day; and lastly, the ordinary wards, containing fifteen to twenty beds, where the price is 2 marks 50 pfennigs. In Dr. Schultze's clinic the wards contain only six, eight, or ten beds. The rooms are large, well aired, well ventilated, and are furnished in some cases with a veranda where tuberculous patients can be treated.

The discussion on the method of Bier, or rachi-cocainization, is far from finished. After Dr. Tuffier's defense, where he analyzes the six cases of death furnished by Dr. Reclus, there appeared another speech by the latter before the Society of Surgery. In this speech Dr. Reclus discusses each part of Tuffier's article, and one cannot help feeling that all he says is full of moderation and good sense. He declares that, though Corning was in a way a predecessor, Bier is the real author of the method; he admits that Tuffier's method is the best so far, but the different details of his technique have been borrowed from others. Dr. Tuffier had spoken sarcastically of surgeons who were obliged to puncture in several places to find the right spot, and Dr. Reclus remarked that this phrase did not seem to apply to any one in particular. Dr. Marx, of New York, had been obliged to try six times in one case, but he has already made 125 lumbar injections, and could not be accused of lacking experience. As for the cases of death observed, Dr. Reclus analyzed them one by one, and showed that the injection of cocaine might have had some influence. Tuffier's case, for instance, is as follows: Two hours after cocainization asphyxia set in, and the patient died almost immediately, though tracheotomy and artificial respiration were resorted to. The autopsy showed that there was a mitral lesion and acute edema of the lung. Goilav's case, as well as that of Jonnesco, should be set aside, according to Dr. Tuffier, because the autopsy was not made; still the rapidity with which death came on in Goilav's case would seem to indicate that the operation itself was not the unique factor. Serious accidents have also been observed by Anderson of Chicago, MacDonald, Kocher of Bern, and Sorel of Havre. Dr. Tuffier states that the statistics furnished about narcosis by chloroform or ether are false, and Dr. Reclus agrees with him, but hints that it is due to the general habit of confiding this to an inexperienced medical student. Dr. Reclus concludes his article by saying that, such as it is, medullar cocainization is uncertain and of doubtful value as a method of anesthesia.

Several other prominent surgeons in Paris have been trying this same method, and at a meeting of the Society of Surgery on the 22d of May they indicated the result of their researches. Professor Lejars had only used it thirty-three times, but had found it best to defer trying it again till the method had been perfected. He adduced the following arguments against it: The insertion of the needle being not always easy; the irregularity of the anesthesia as to appearance, localization, intensity, and duration; and lastly, the vomiting which takes place sometimes during the operation. This method should, however, be used when the patient is affected with pulmonary trouble, or does not wish to take chloroform or ether. Dr. Legueu has already used cocaine 150 times, and in four cases there was no result. The analgesia was perfect in about 100 cases, and in fifty cases sufficient. In one-third of the cases there was vomiting and tremor of the limbs, and in ten cases incontinence

of the anal sphincter. Cephalalgia was of frequent occurrence; paralysis of the legs was seen once, but only lasted a few days; retention and incontinence of urine were also seen once. Dr. Legueu thinks that the use of cocaine cannot be shown as yet to be more dangerous than that of chloroform.

The pharmaceutical expenses in the hospitals have been increasing yearly in Paris, and a notice was sent recently to the physicians asking them to do their utmost to reduce the expenditure entailed thereby. Some of the items indicated in this report are of interest as showing how fashions in drugs change with time. Codeine was not much used at one time, only two kilogrammes being employed, whereas now forty-five kilogrammes are found necessary. Moreover, the price has gone up from 400 to 700 francs a kilogramme. The amount of alcohol used is also very large, in value 135,000 francs. Musk costs 4500 francs, pilocarpine 3000 francs, digitaline 30,000 francs, and homatropine 20,000 francs the kilogramme.

Dr. Lermoyez, physician of the hospitals, has written an article in the *Presse Médicale* in which he ridicules the statement that physicians of the hospitals are extravagant in the use of drugs. After a word or two addressed to the very distinguished secretary of the Assistance Publique, who is replacing the general director, now deceased, he remarks that the circular shows how advantageously codeine might be replaced by morphine, which costs one-third less. Now cocaine is supposed to cost 800 francs per kilogramme, but as only ten centigrammes is necessary to produce local anesthesia, the actual cost is only eight centimes, or a cent and a half. Pilocarpine costs 3000 francs, it is true, and each time that Dr. Lermoyez has occasion to order it in his service he sees his druggist come to expostulate, and yet only fifteen injections are requisite to cure a labyrinthic affection, which makes an expenditure of nine cents. Of course, where the greatest expense is to be found is in the use of digitalin, which costs 30,000 francs the kilogramme. Dr. Potain, who is responsible for the use of this alkaloid in the French hospitals, can hardly be remembered with pleasure by the functionaries of the Avenue Victoria, the headquarters of the Assistance Publique. Still he would plead that it is only necessary to give a milligramme to bring back to life a patient suffering from mitral regurgitation, and that it does not seem to be so very much to spend two cents to cure three cases of asystolia.

At a recent meeting of the Society of Therapeutics, Dr. Herard de Besse advocated a new treatment of cancer, which consists in the local application of Flemming's solution of osmic acid and interstitial injections of the same preparation. The urine did not seem to be affected to any appreciable extent, and the results obtained were manifest diminution of the pain and a decrease in the secretions and fetor. This treatment can be compared favorably to that by methylene blue. Chloride of calcium has been recommended recently as a treatment of excessive menstrual flow, and the following formula has been indicated:

> Chloride of calcium, 9 grammes;
> Syrup of sugar, 60 grammes;
> Water, 180 grammes.
> Two large spoonfuls daily.

This should be taken a whole week before the period expected. Chloride of calcium should not be given, however, when renal lesions are found.

The German mineral waters are more known in America than the French ones of the same category, thanks to the judicious system of improvement and advertising carried out by the promoters of these watering establishments. Amongst French watering-places, however, there is one which preserves its world-wide reputation, and which from a financial point of view is in a very prosperous condition, and this is Vichy. Its sources and its establishment belong to the State, but the latter rents it to a company, who have just renewed their lease for thirty years, with the understanding that they will spend ten millions of francs in improvements. Though a large part of the benefits are derived from visiting patients, a good deal is obtained from exportation. As there is no Kurtax as in Germany, it is impossible to give the exact number of visitors, but to judge from the statistics furnished by the railway company there were about 45,000 last year during the six months that the season lasts. In 1900, 14,700,000 bottles of Vichy water were exported, while only 461,000 were sent out in 1853. The financial result has been such that the shares of the company, which were sold originally at 500 francs, have been divided into four parts, each of which is worth 2000 francs.